

RECLAMATION

Managing Water in the West



**Navajo Unit Operations
August 24, 2010
Coordination Meeting**



U.S. Department of the Interior
Bureau of Reclamation

Agenda

- Welcome
- Water Year 2010 Hydrologic Conditions
- Review of Water Year 2010 Operations
- Current Conditions
- Water Year 2011 Forecasts and Proposed Operations
- Navajo Dam Maintenance Activities
- Non-Navajo Ditch Improvement Update
- Fish & Wildlife Service/San Juan RIP Update
- Reports from other Agencies
- Questions from Audience
- How To Access Information
- Special Presentation – Aquatic Invasive Species
- Close

RECLAMATION

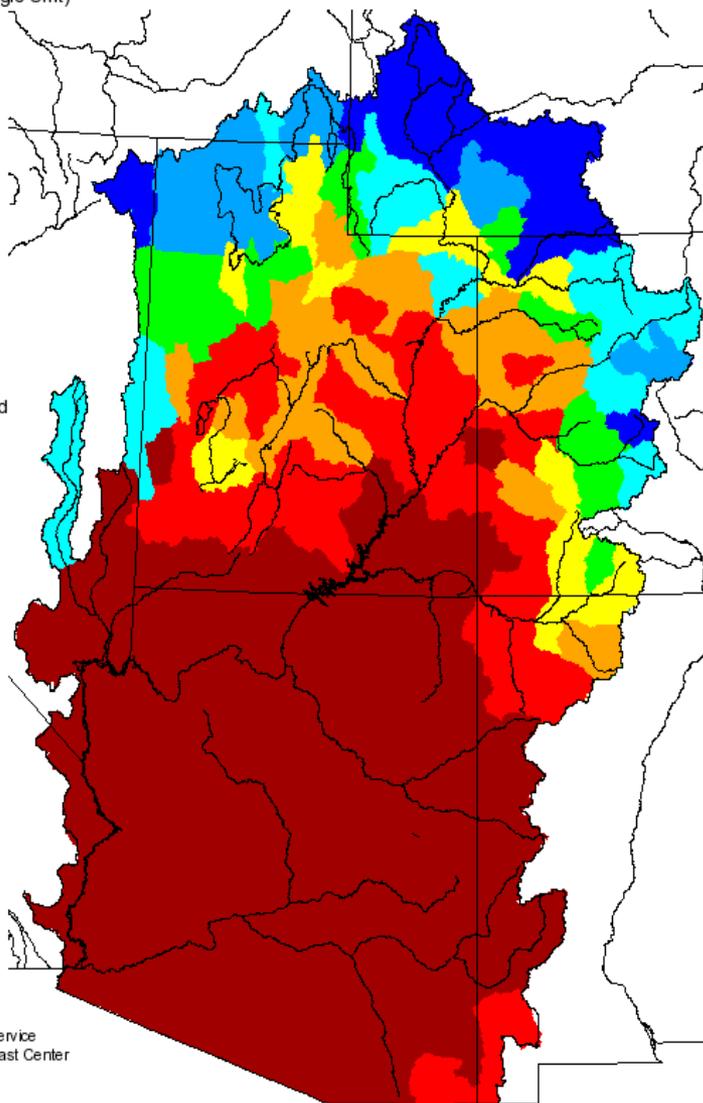
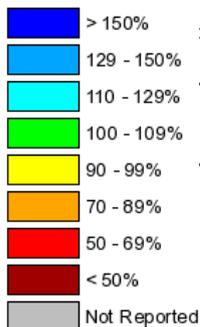


Water Year 2010 Hydrologic Conditions

Monthly Precipitation for October 2009

(Averaged by Hydrologic Unit)

% Average

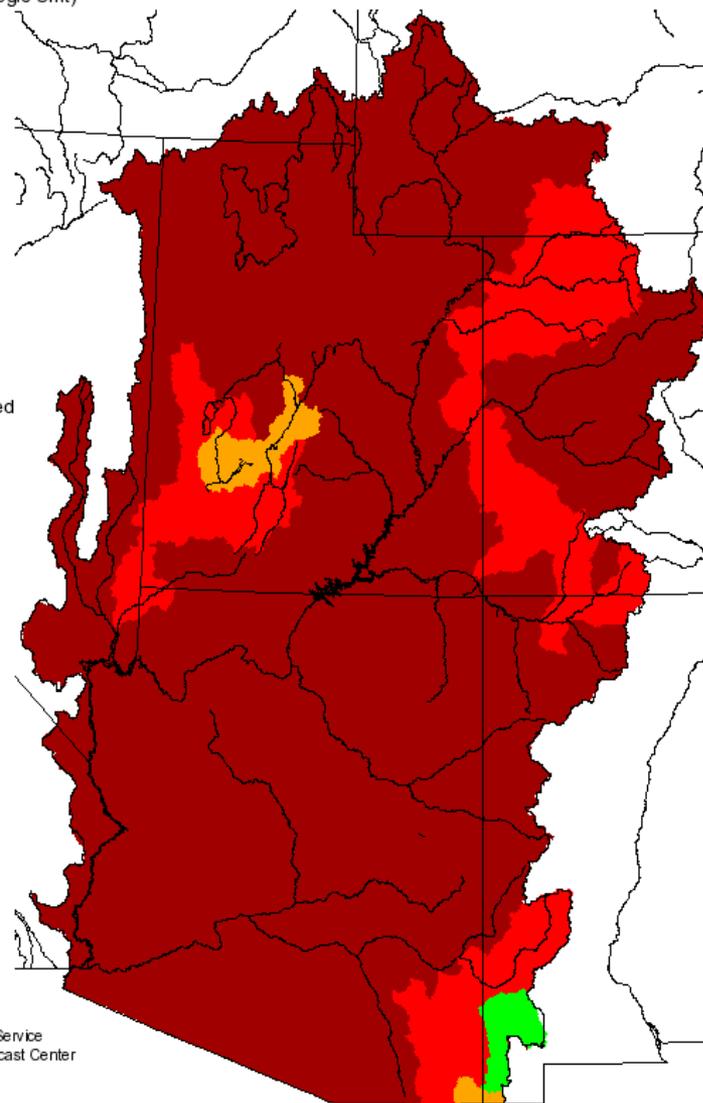
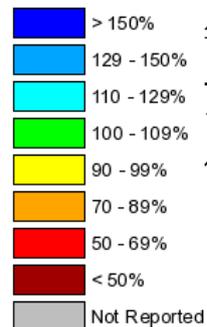


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Monthly Precipitation for November 2009

(Averaged by Hydrologic Unit)

% Average

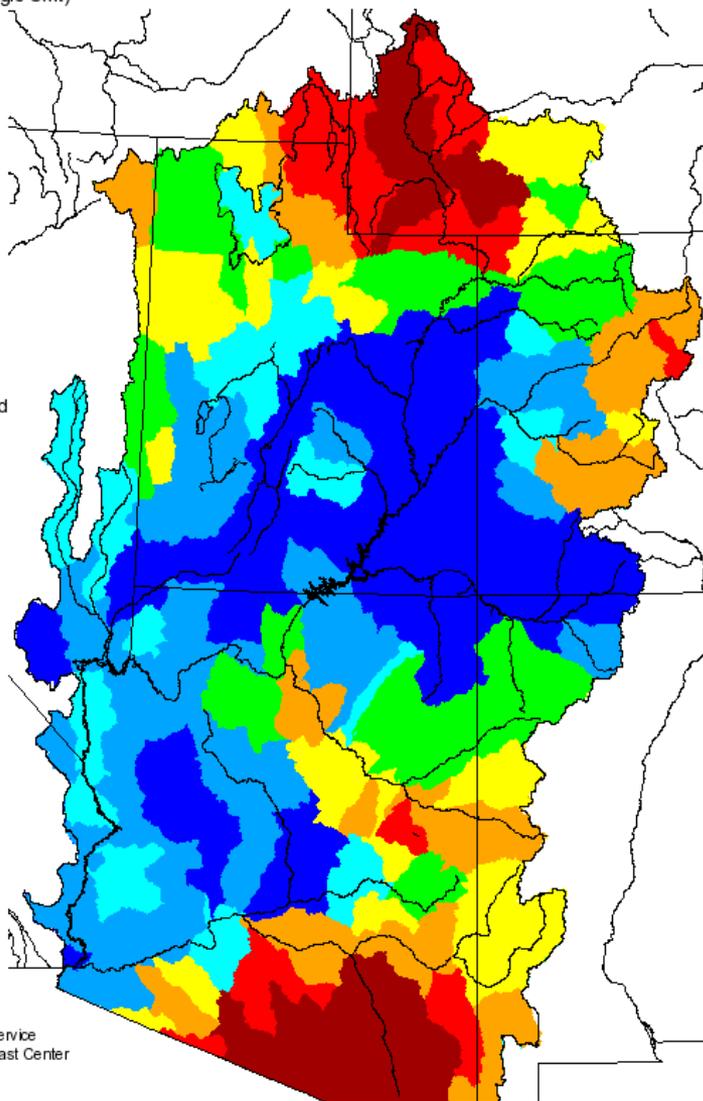
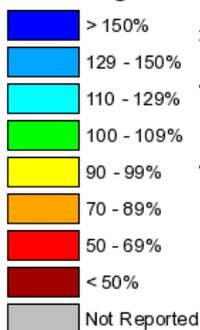


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Monthly Precipitation for December 2009

(Averaged by Hydrologic Unit)

% Average

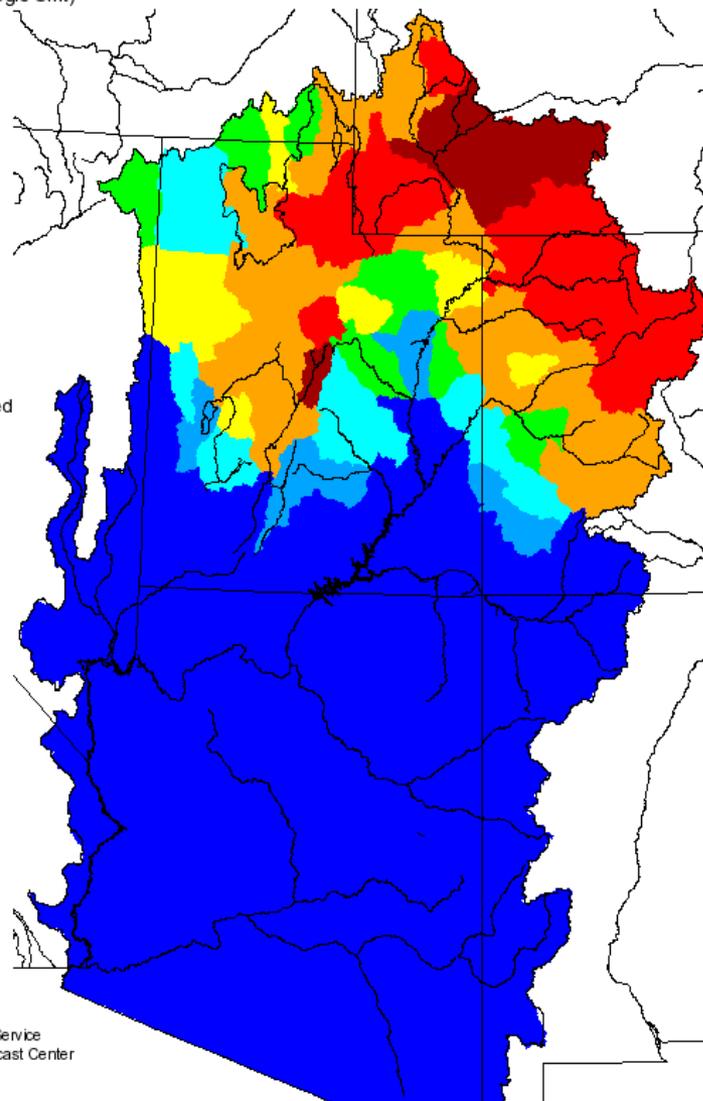
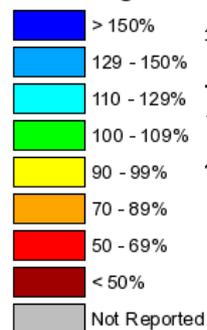


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbffc.noaa.gov

Monthly Precipitation for January 2010

(Averaged by Hydrologic Unit)

% Average

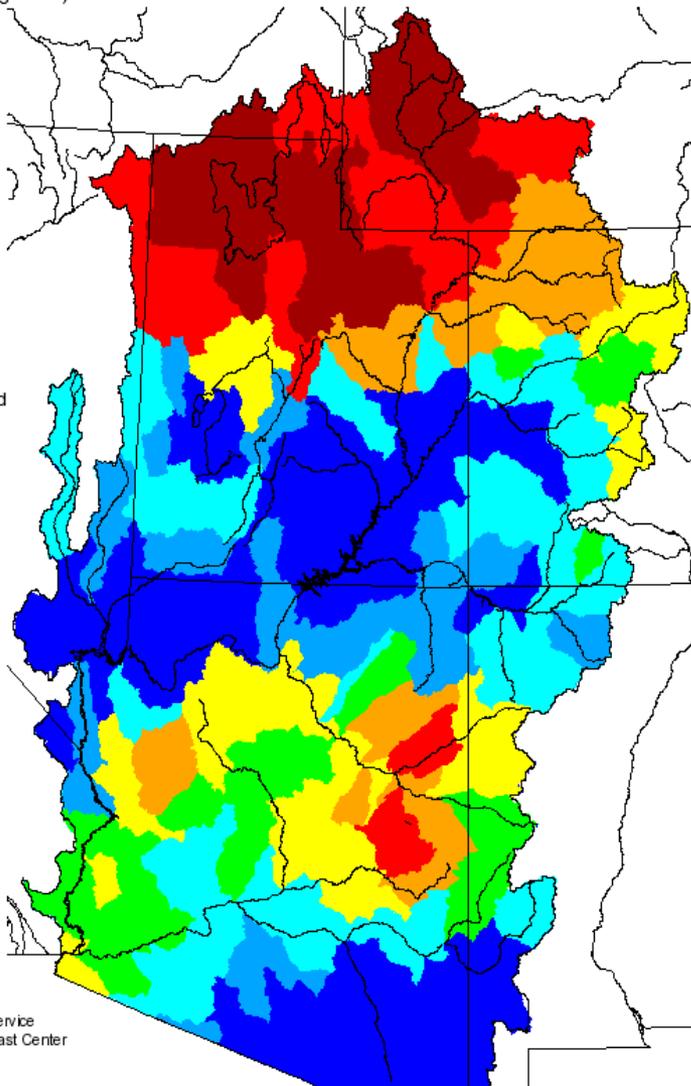
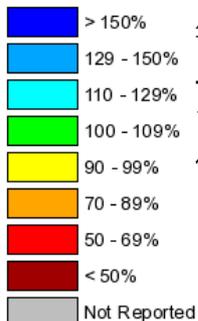


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbffc.noaa.gov

Monthly Precipitation for February 2010

(Averaged by Hydrologic Unit)

% Average

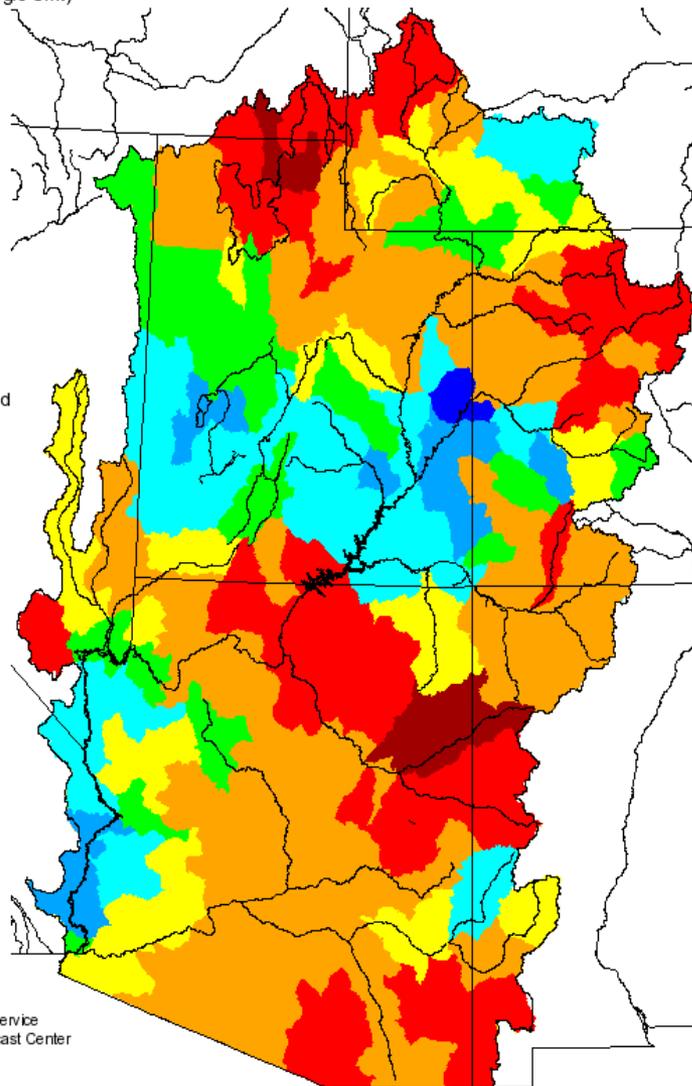
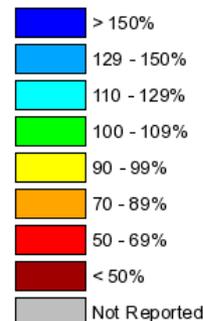


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbfc.noaa.gov

Monthly Precipitation for March 2010

(Averaged by Hydrologic Unit)

% Average

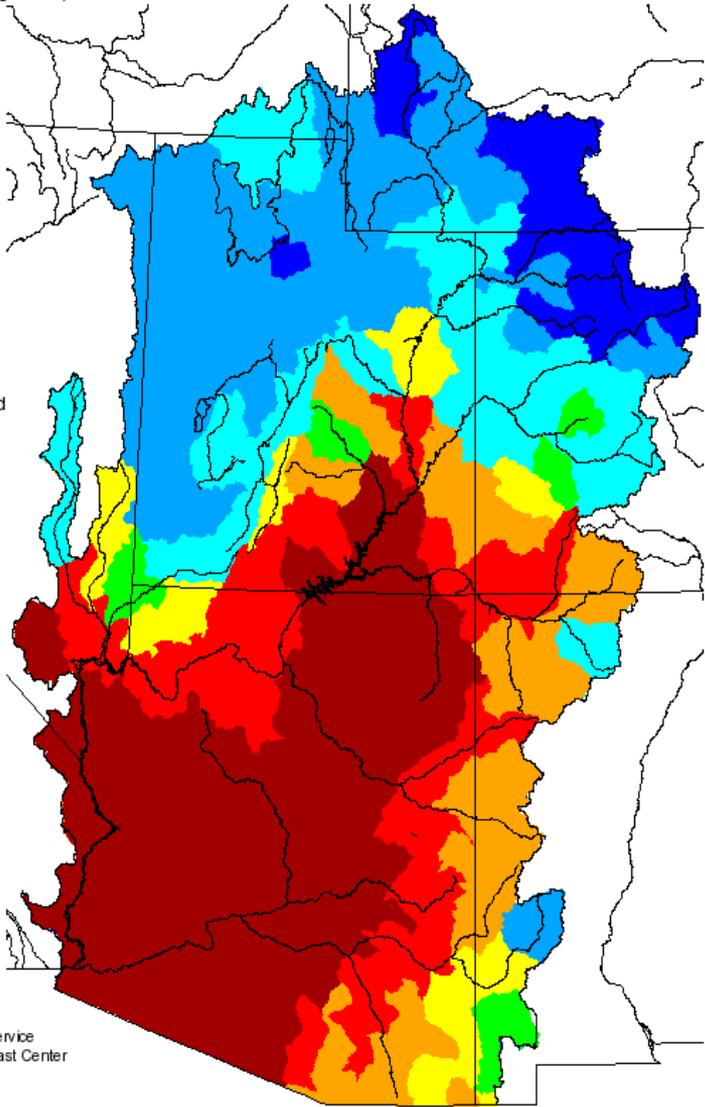
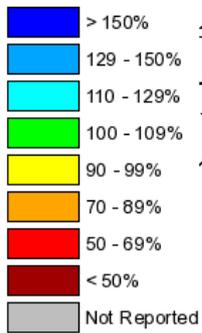


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbfc.noaa.gov

Monthly Precipitation for April 2010

(Averaged by Hydrologic Unit)

% Average

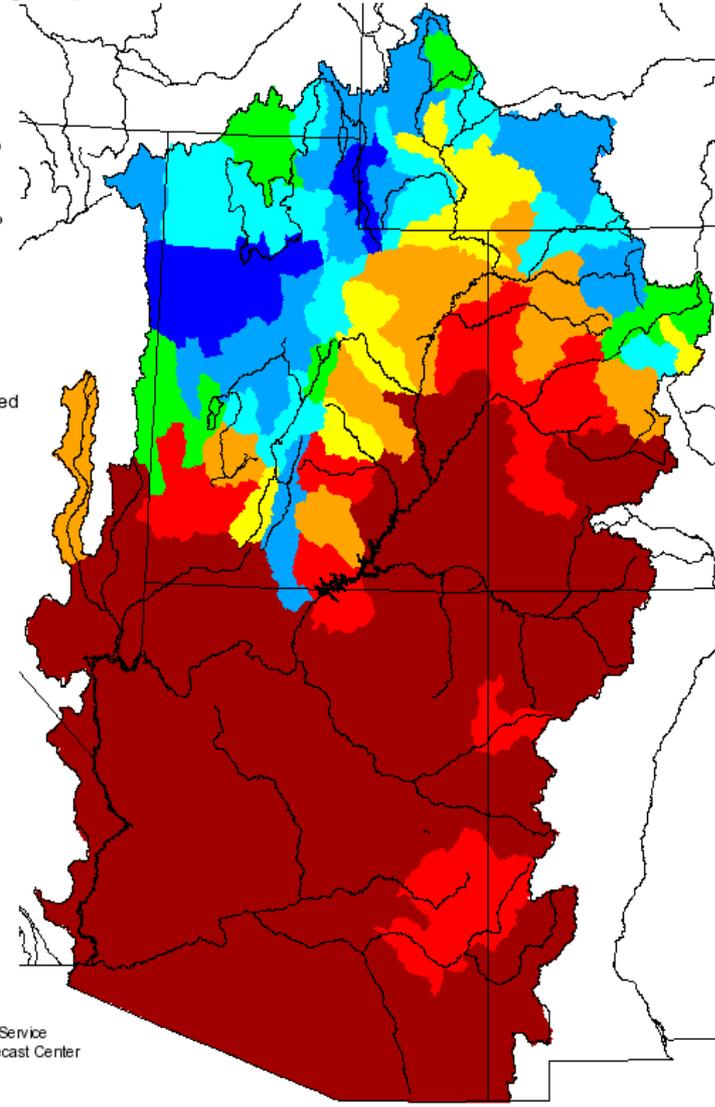
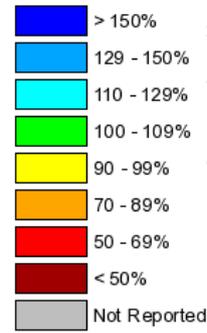


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

Monthly Precipitation for May 2010

(Averaged by Hydrologic Unit)

% Average

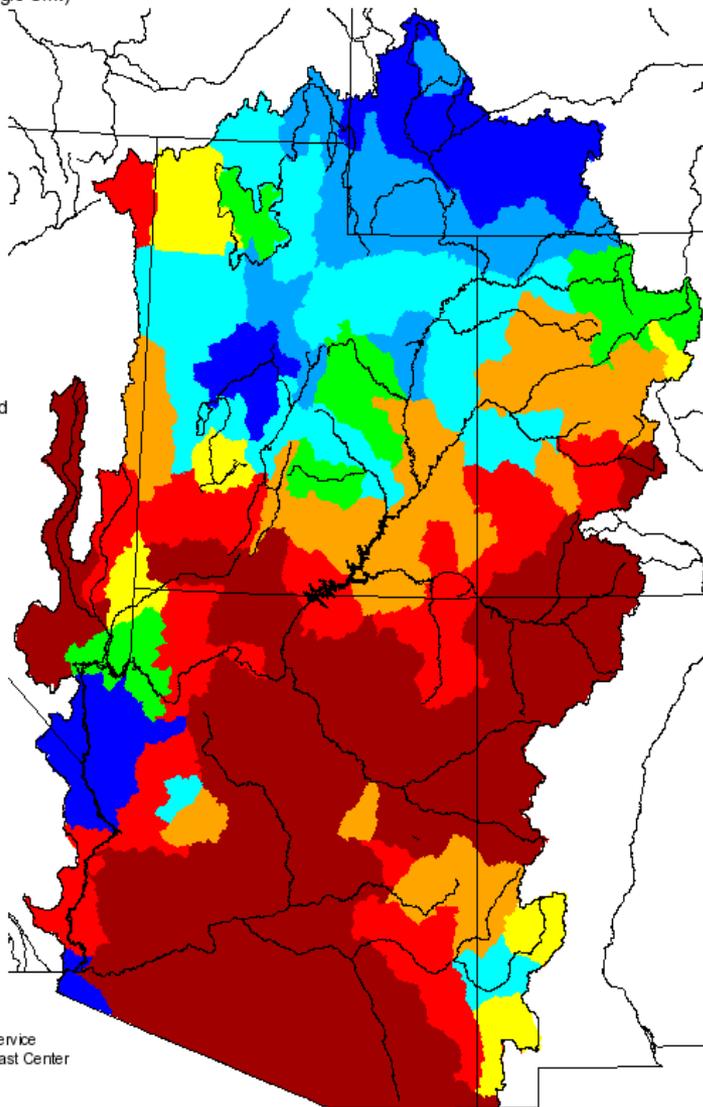
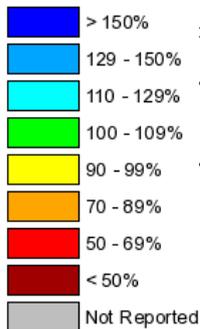


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

Monthly Precipitation for June 2010

(Averaged by Hydrologic Unit)

% Average

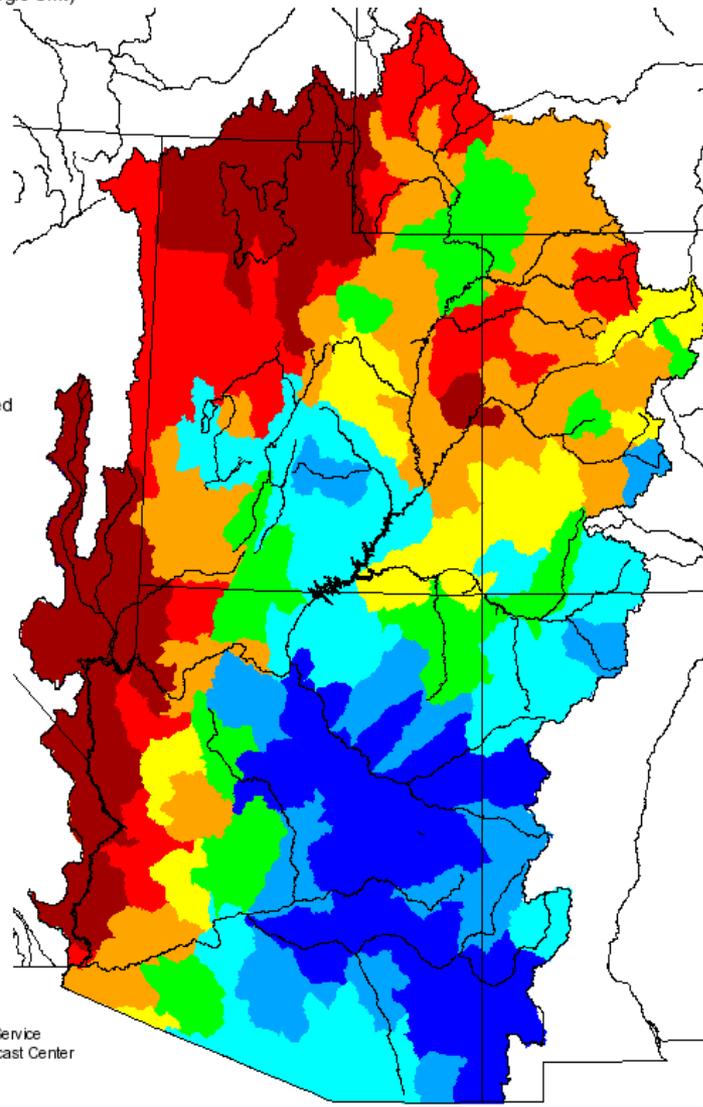
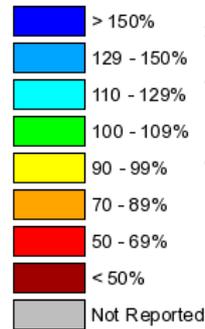


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

Monthly Precipitation for July 2010

(Averaged by Hydrologic Unit)

% Average

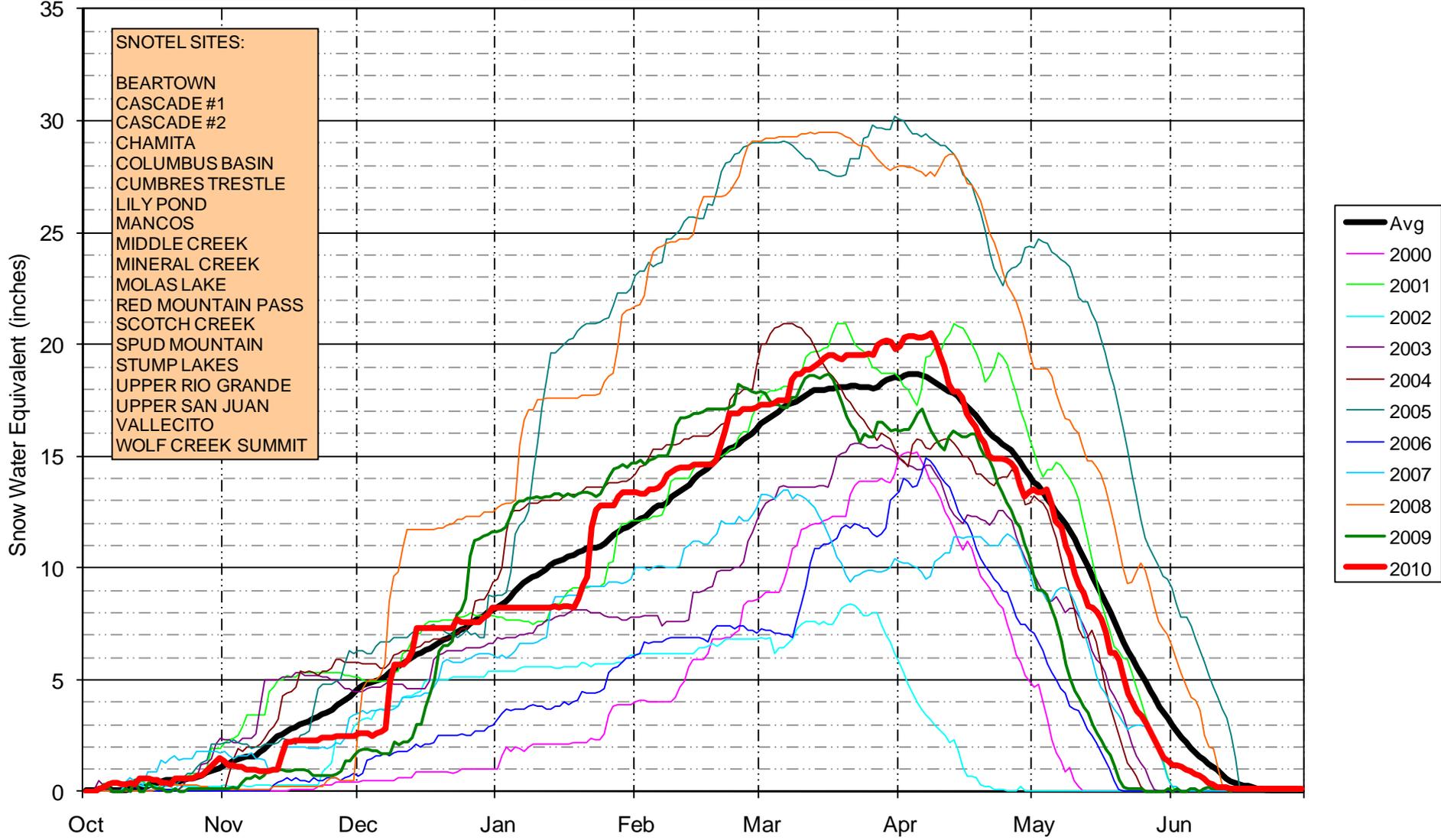


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbafc.noaa.gov

San Juan Basin Multiple Station Snotel Plot

August 11, 2010

2010 San Juan Basin Combined SNOTEL

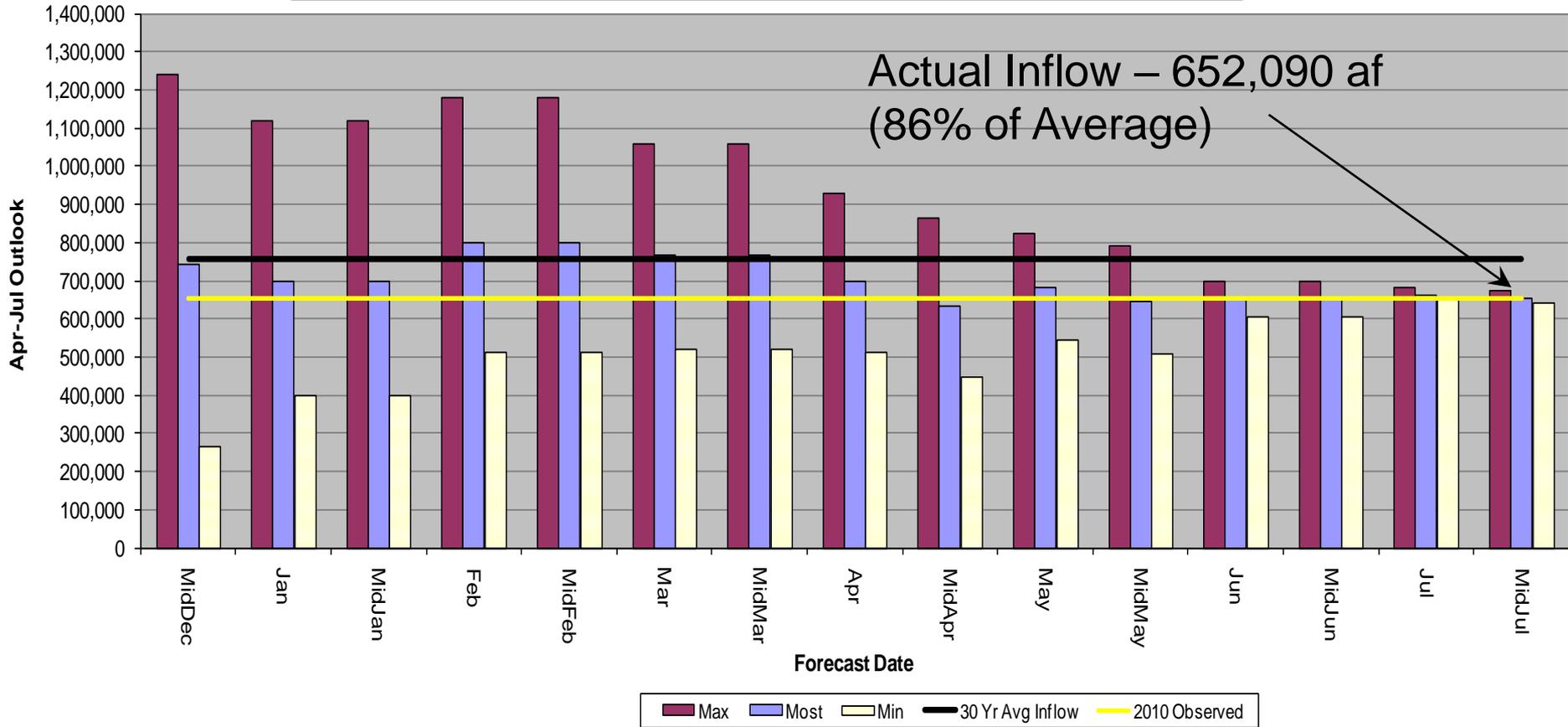


Water Year 2010 (as of 8/11/2010)

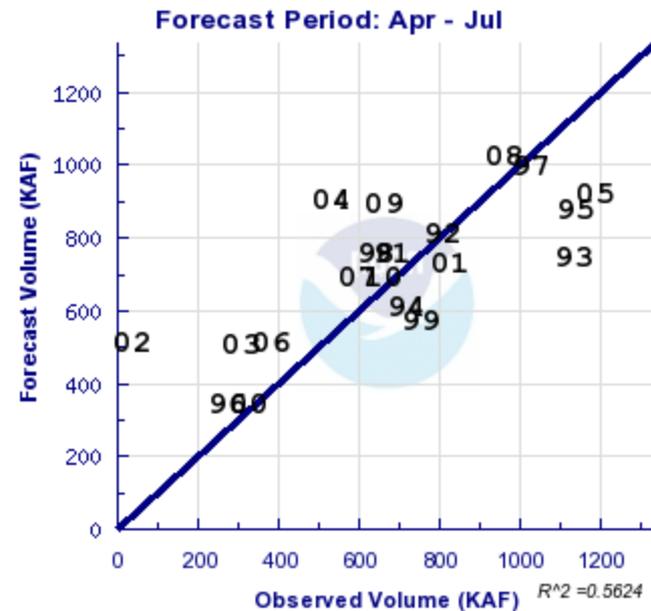
Navajo Inflows & San Juan Basin Snowpack

EOM	Inflow (af)	% Average	SJ SWE (in.)	% Average
October	20,830	41%	1.7	116%
November	13,929	42%	3.0	54%
December	16,144	50%	8.9	99%
January	13,775	66%	14.4	115%
February	16,144	52%	18.2	110%
March	68,074	75%	21.3	102%
April	179,233	122%	16.9	85%
May	182,121	82%	2.5	27%
June	116,108	61%	0.1	13%
July	39,269	52%	0.0	--

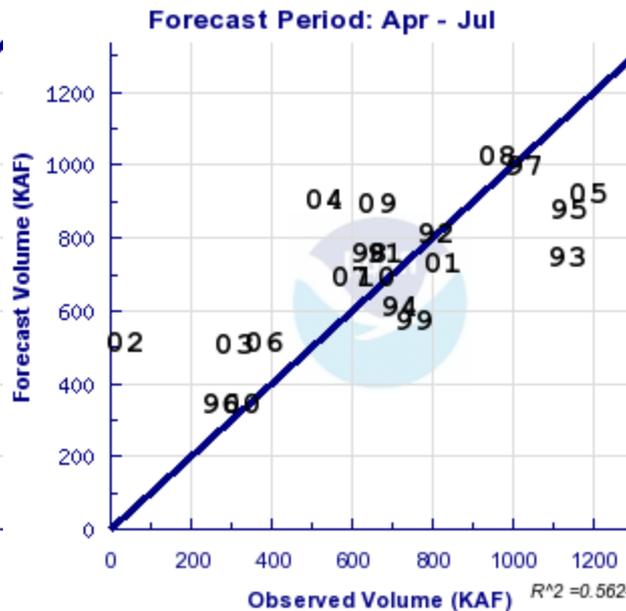
WY2010 CBRFC - Navajo Reservoir Most, Max and Min Inflow Forecasts (acre-feet)



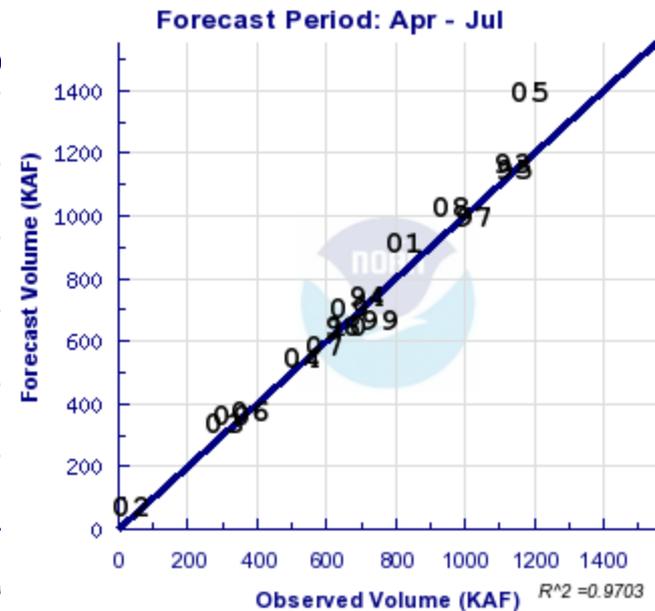
April – July Inflow Volume Coordinated Forecast Verification Scatterplot



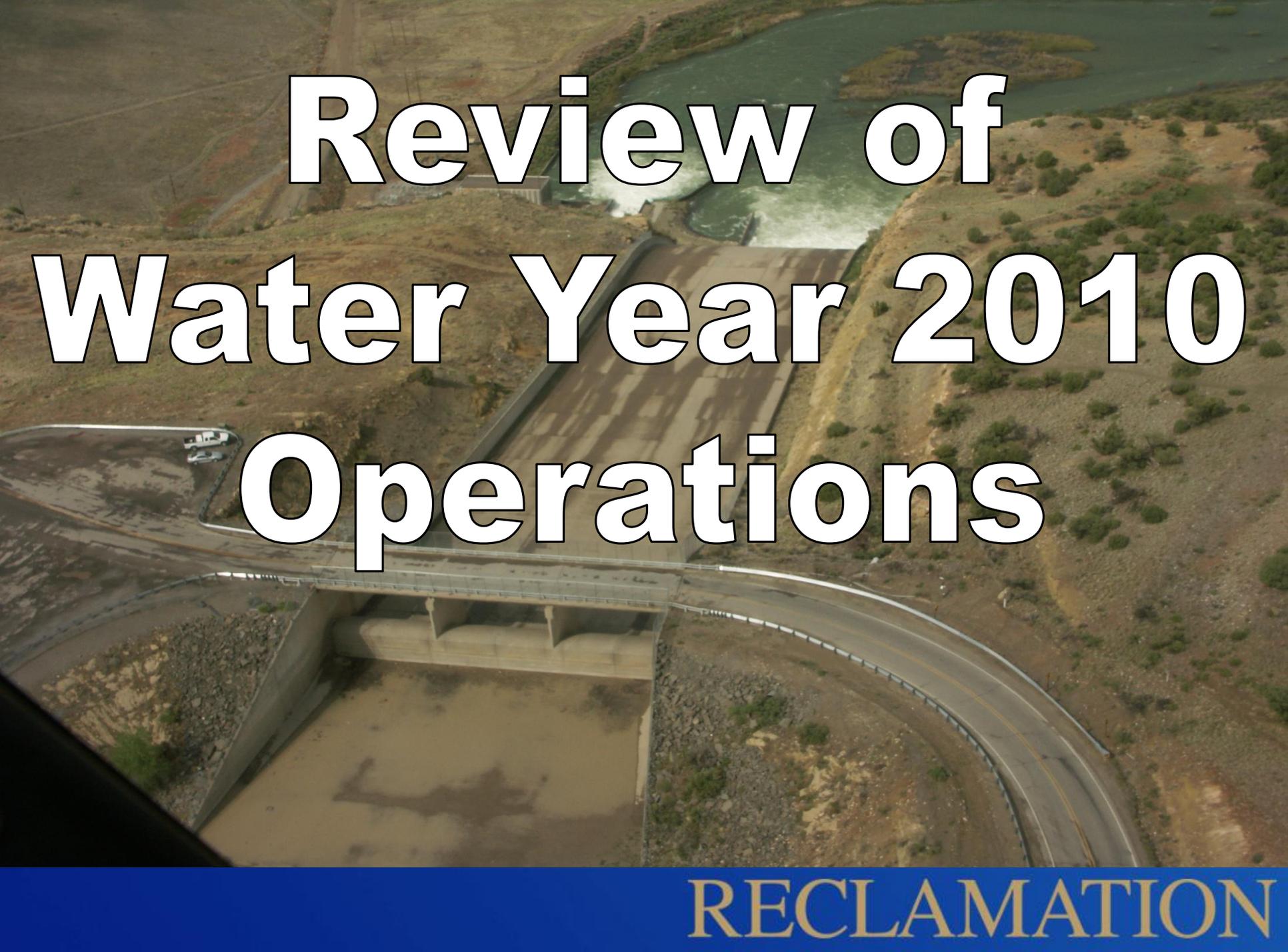
January Coordinated Forecast



April Coordinated Forecast



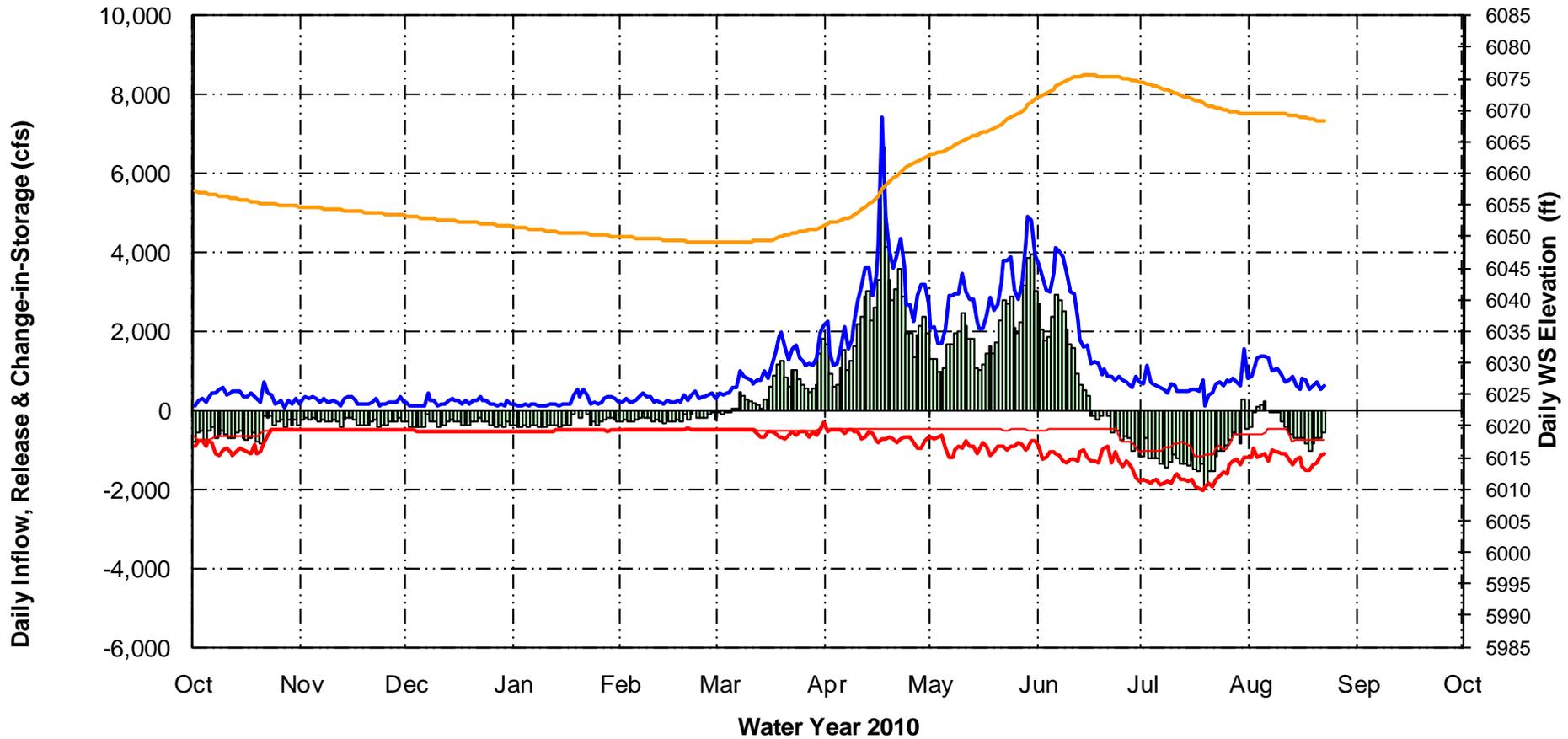
June Coordinated Forecast

An aerial photograph of a large concrete dam with a reservoir behind it. The dam has several spillways. A road curves around the right side of the dam. The surrounding landscape is arid with sparse vegetation. The text "Review of Water Year 2010 Operations" is overlaid in large white letters with a black outline.

Review of Water Year 2010 Operations

RECLAMATION

NAVAJO RESERVOIR OPERATIONS



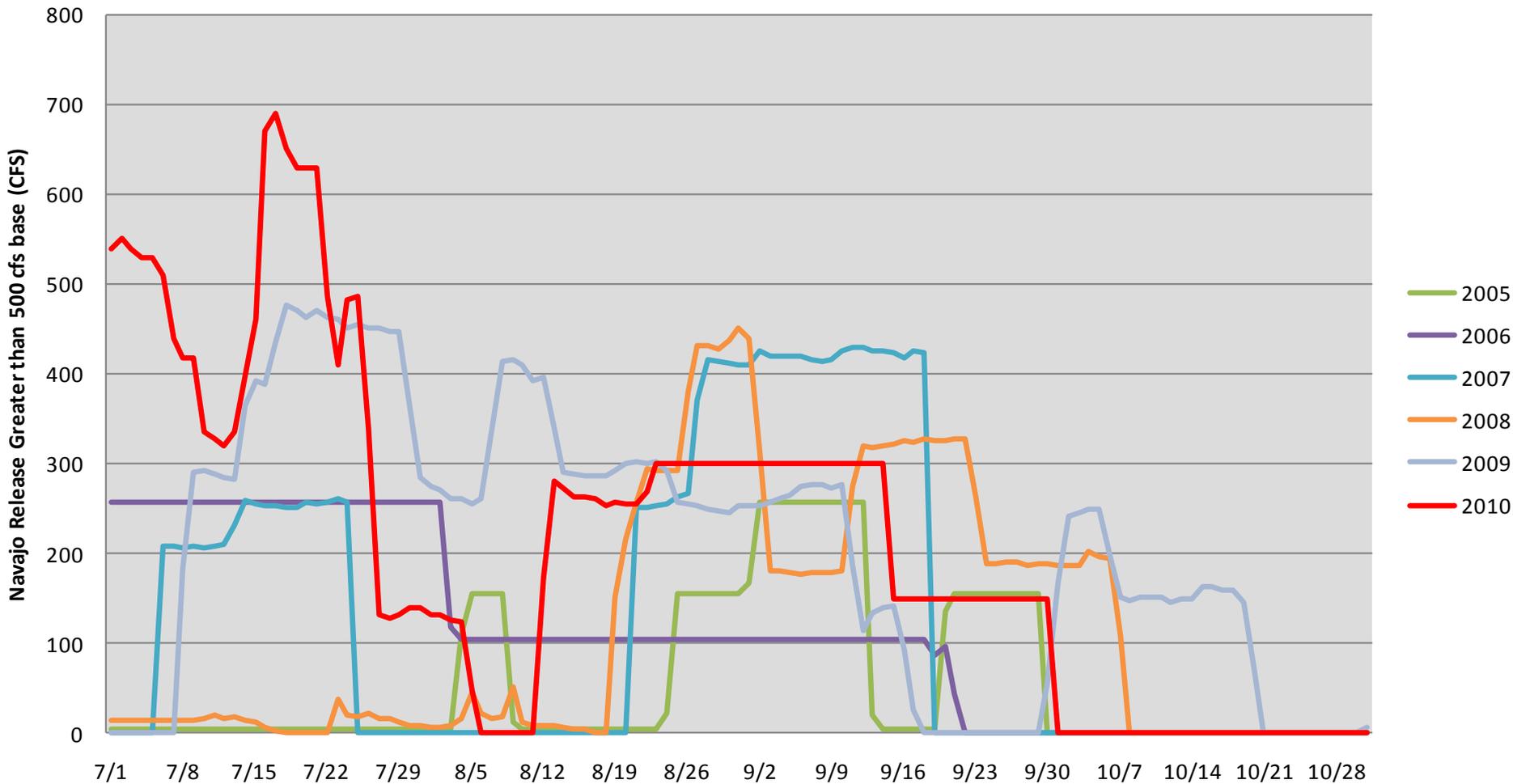
SJRIP Spring Peak Flow Goals

Critical Habitat Gages	>10,000 cfs for 5-days Req. Frequency – 20%	>8000 cfs for 10-days Req. Frequency – 33%	>5000 cfs for 21-days Req. Frequency – 50%	>2500 cfs for 10-days Req. Frequency – 80%
San Juan River @ 4 Corners	0	0	0	20

Chasing the Target Baseflow

- Base releases remained at 500 cfs until June 24th
- Tributary inflow + Navajo Releases keep the river within Target Base Flow range
- Increased release to 850 cfs on June 24th, up to 1100 cfs on July 16th
- Continue to monitor flow in the Critical Habitat and make release adjustments as necessary

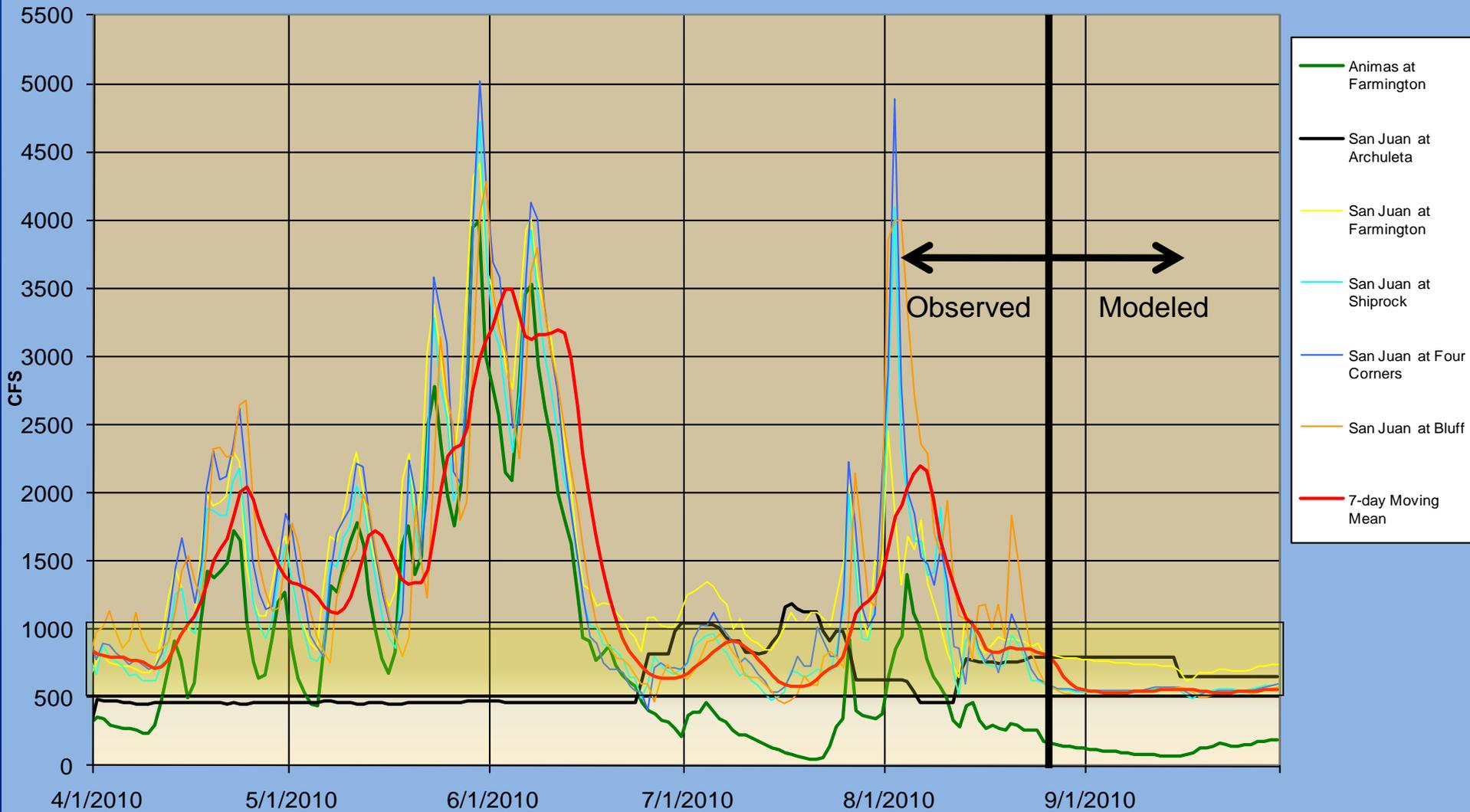
Supplemental Navajo Releases To Meet Downstream Target Base Flows (2005-2010)



RECLAMATION

USGS Provisional Mean Daily Flows

Updated on 8/23



RECLAMATION

An aerial photograph showing a large reservoir or dammed river section. The water is a milky, greenish-turbid color. The surrounding landscape is a mix of arid, rocky hills and dense green riparian vegetation along the riverbanks. A road is visible at the top of the image.

Current Conditions

RECLAMATION

Navajo Current Conditions

(as of 8/22/10)

Elevation = 6068.2 (104% of Average)

Storage = 1,456,352 af (86% Full)

Inflow = 653 cfs*

Release = 800 cfs

NIIP = 592 cfs*

San Juan-Chama Diversion = 6 cfs*

* Average of the last 7 days

RECLAMATION

Nearby Reservoirs

(8/22/10)

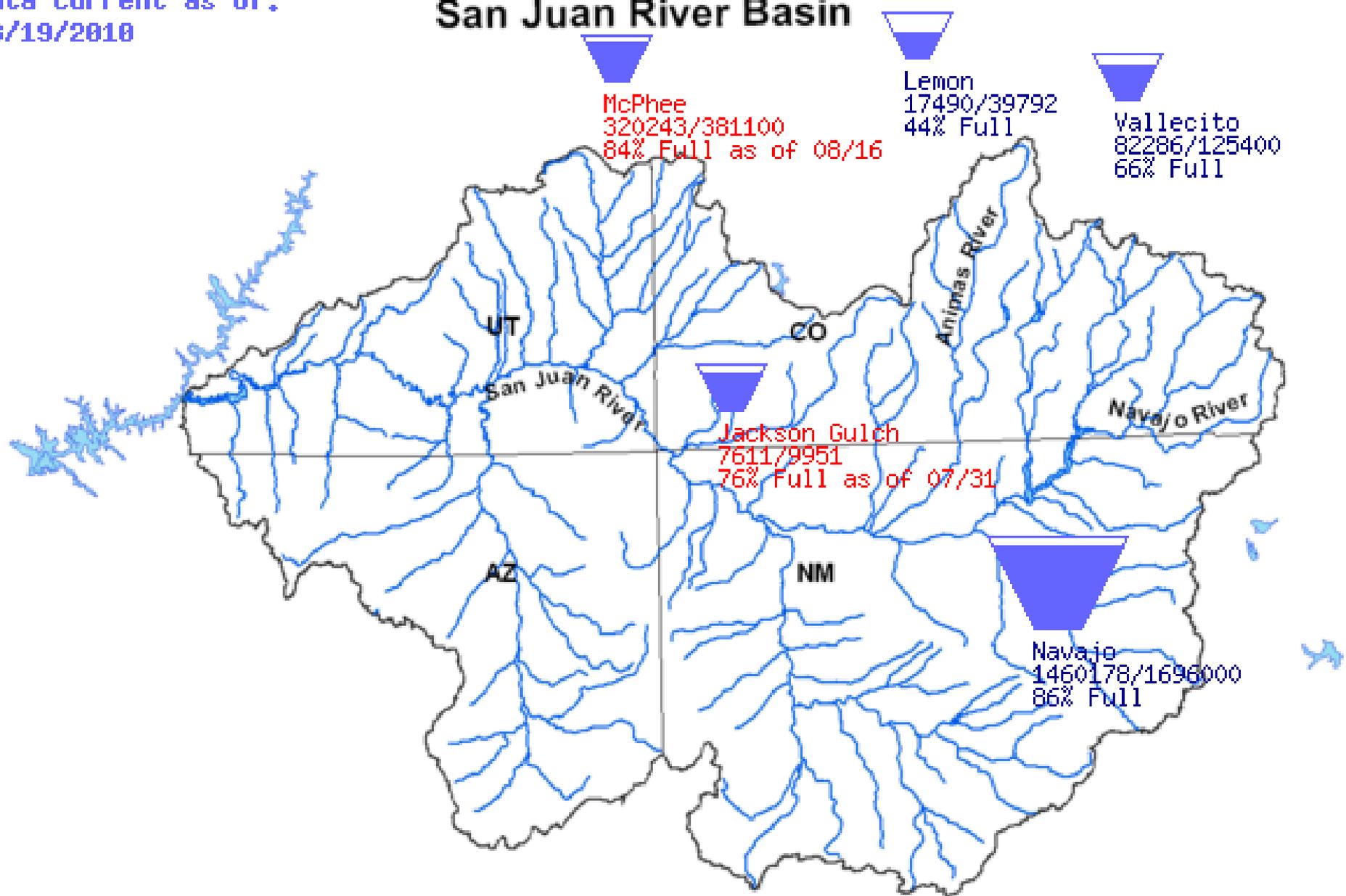
Vallecito

- Elevation = 7642.64 (66% Full, 103% of average)
- Storage = 80,294 af
- Release = 553 cfs
- Inflow = 244 cfs*

Lemon

- Elevation = 8103.28 (44% Full, 74% of average)
- Storage = 16,976 af
- Release = 139 cfs
- Inflow = 51 cfs*

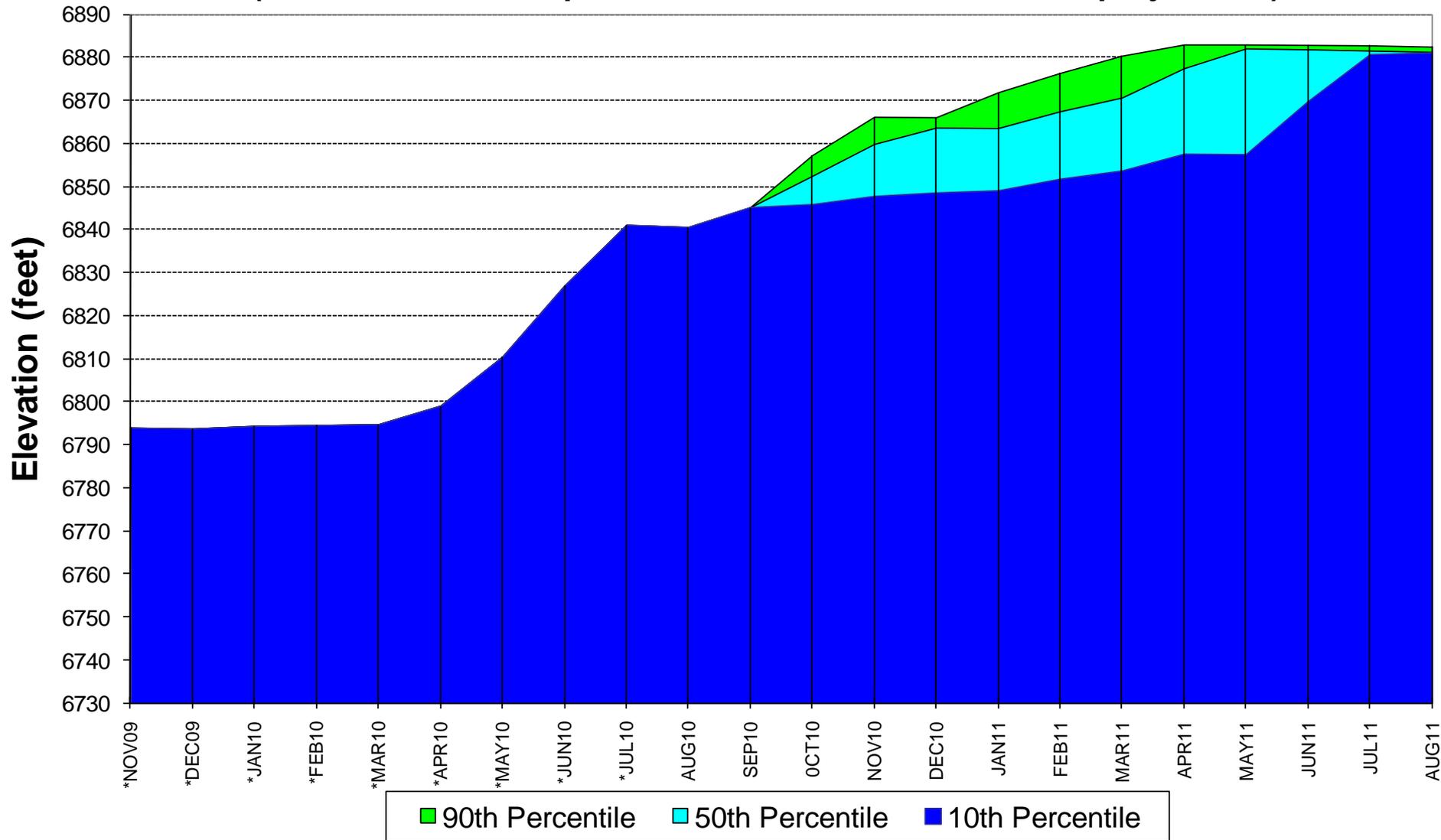
San Juan River Basin



Animas-La Plata Project

- Reservoir is 59% full – 72,000 af stored
- No Pumping in July due to holding period
- Currently pumping ~95 cfs (5841 af per month)
- Most probable fill – end of April 2011
- Minimum probable fill – end of July 2011
- Navajo Nation Municipal Pipeline is currently under construction

**Projected First Fill Schedule
based on the August 10 Final Forecast
(see attached assumptions and constraints for basis of projections)**





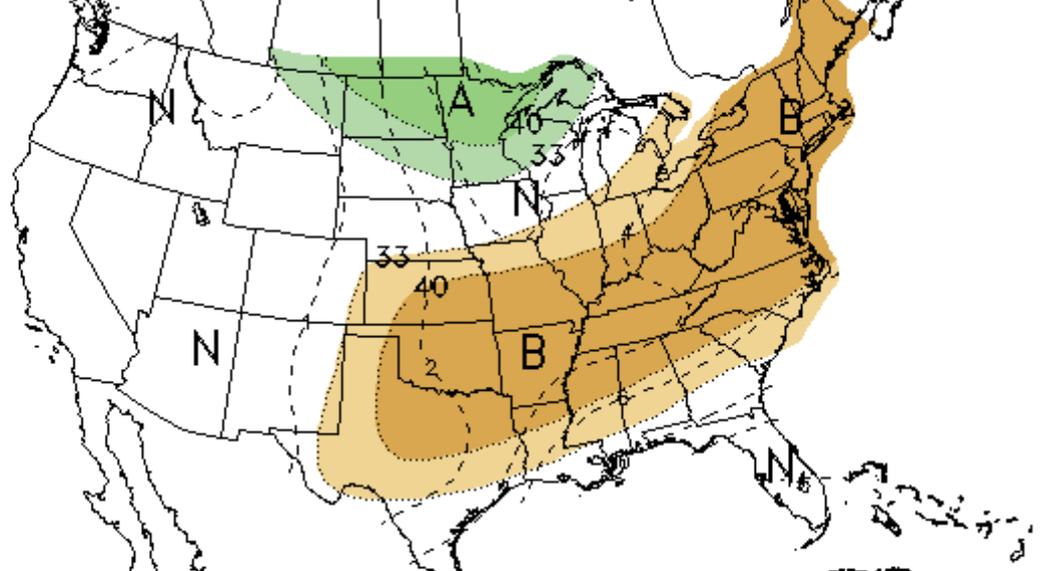


**Water Year 2011
Forecasts &
Proposed Operations**

RECLAMATION

Climate Prediction Center Precip. Outlooks

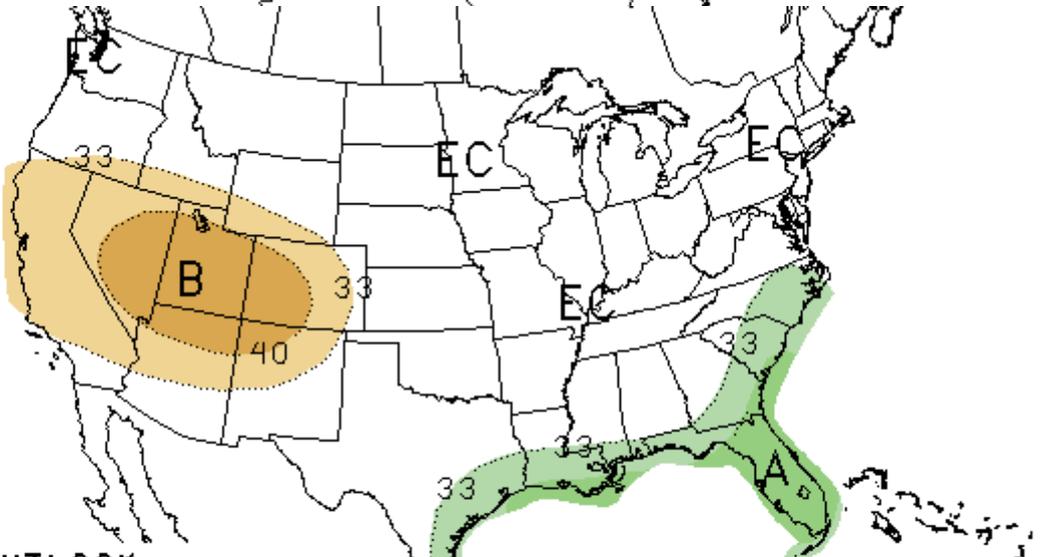
8-14 Day →



8-14 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 22 AUG 2010
VALID AUG 30 - SEP 05, 2010

DASHED BLACK LINES ARE CLIMATOLOGY (TENTHS OF INCHES) SHADED AREAS ARE FCS VALUES ABOVE (A) OR BELOW (B) MEDIAN UNSHADED AREAS ARE NEAR-MEDIAN

September Monthly →



ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID SEP 2010
MADE 19 AUG 2010

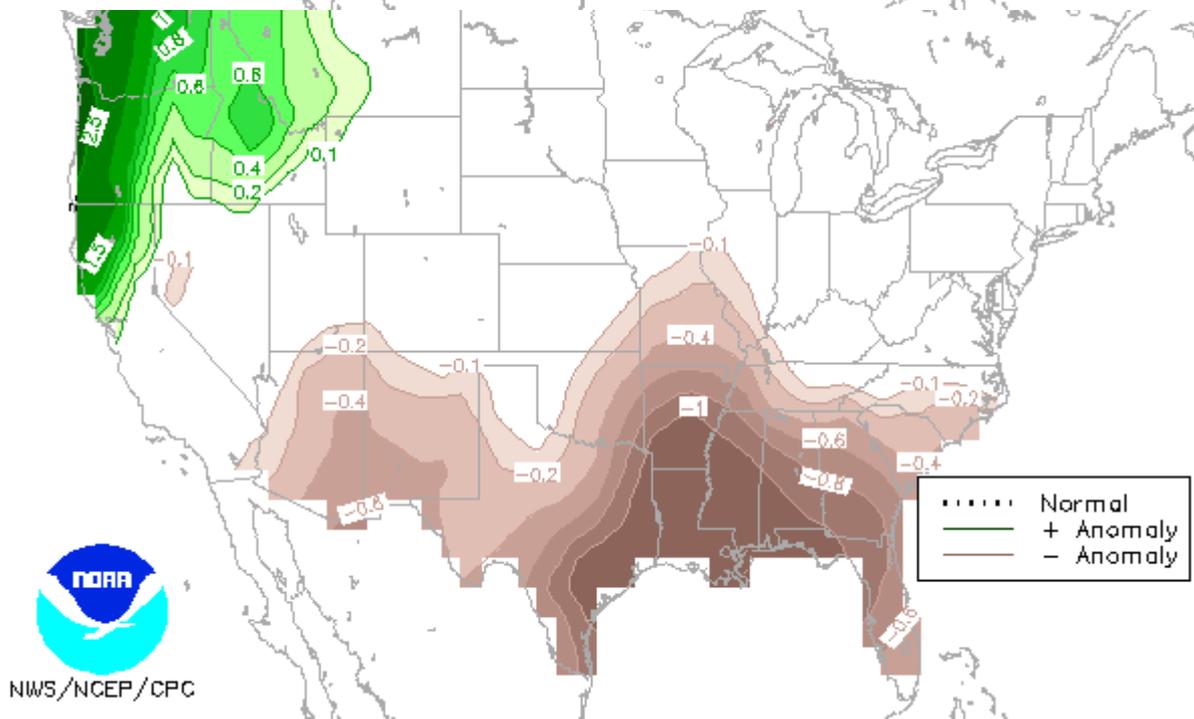
EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

Climate Prediction Center Seasonal Precipitation Outlooks

September-October-November



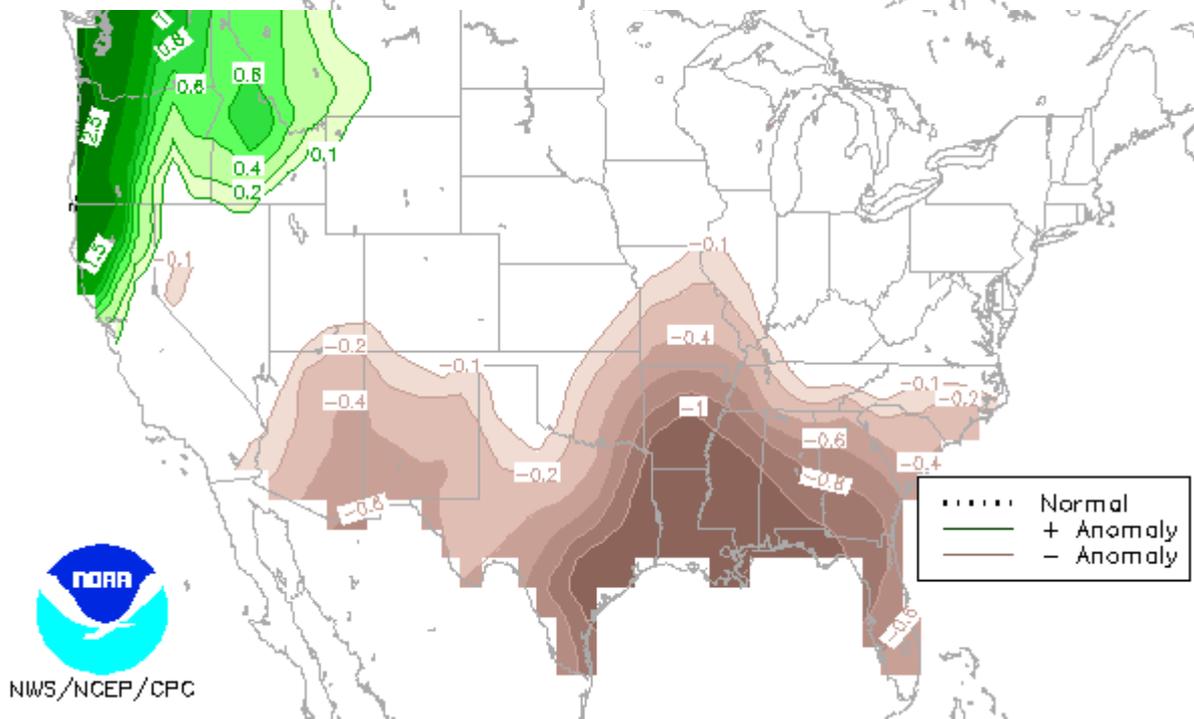
NWS/NCEP/CPC

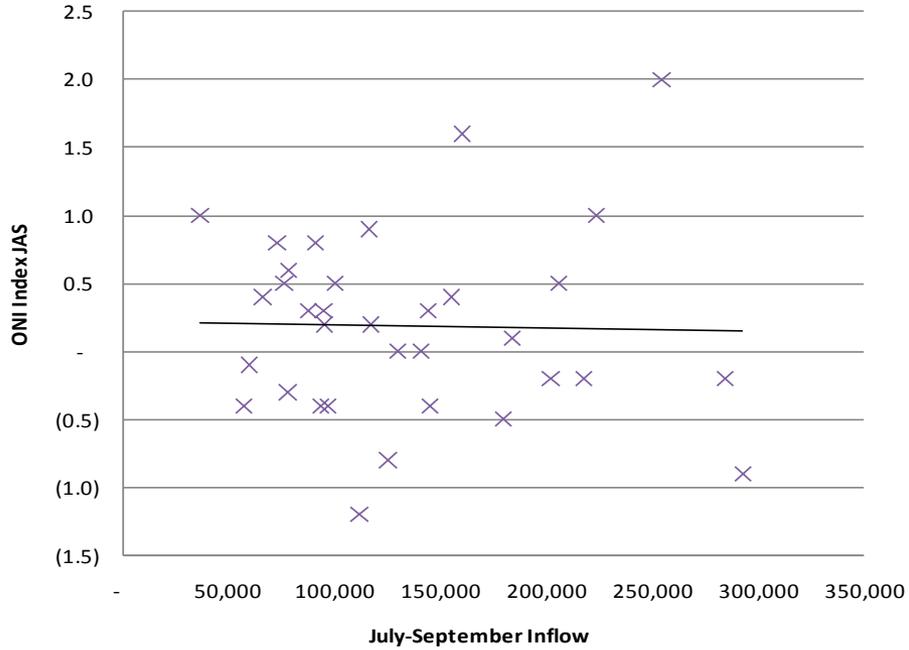


October-November-December

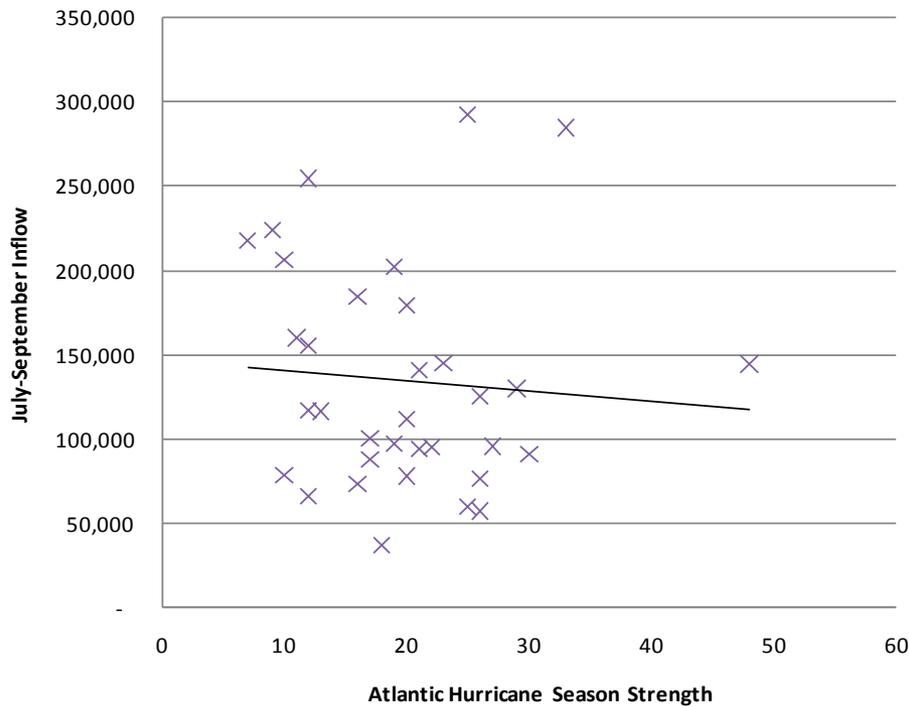
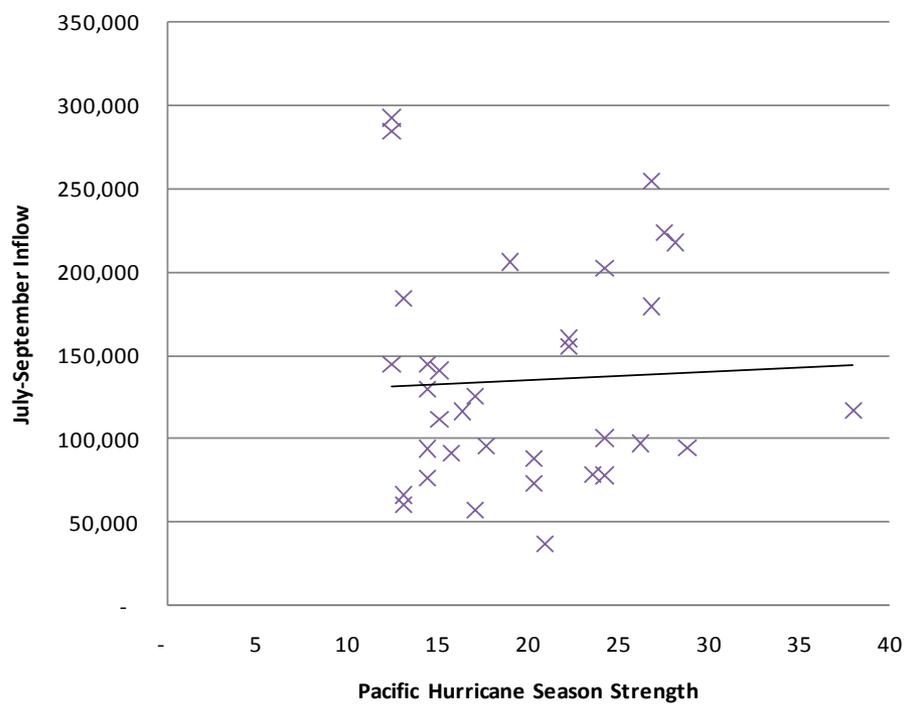


NWS/NCEP/CPC



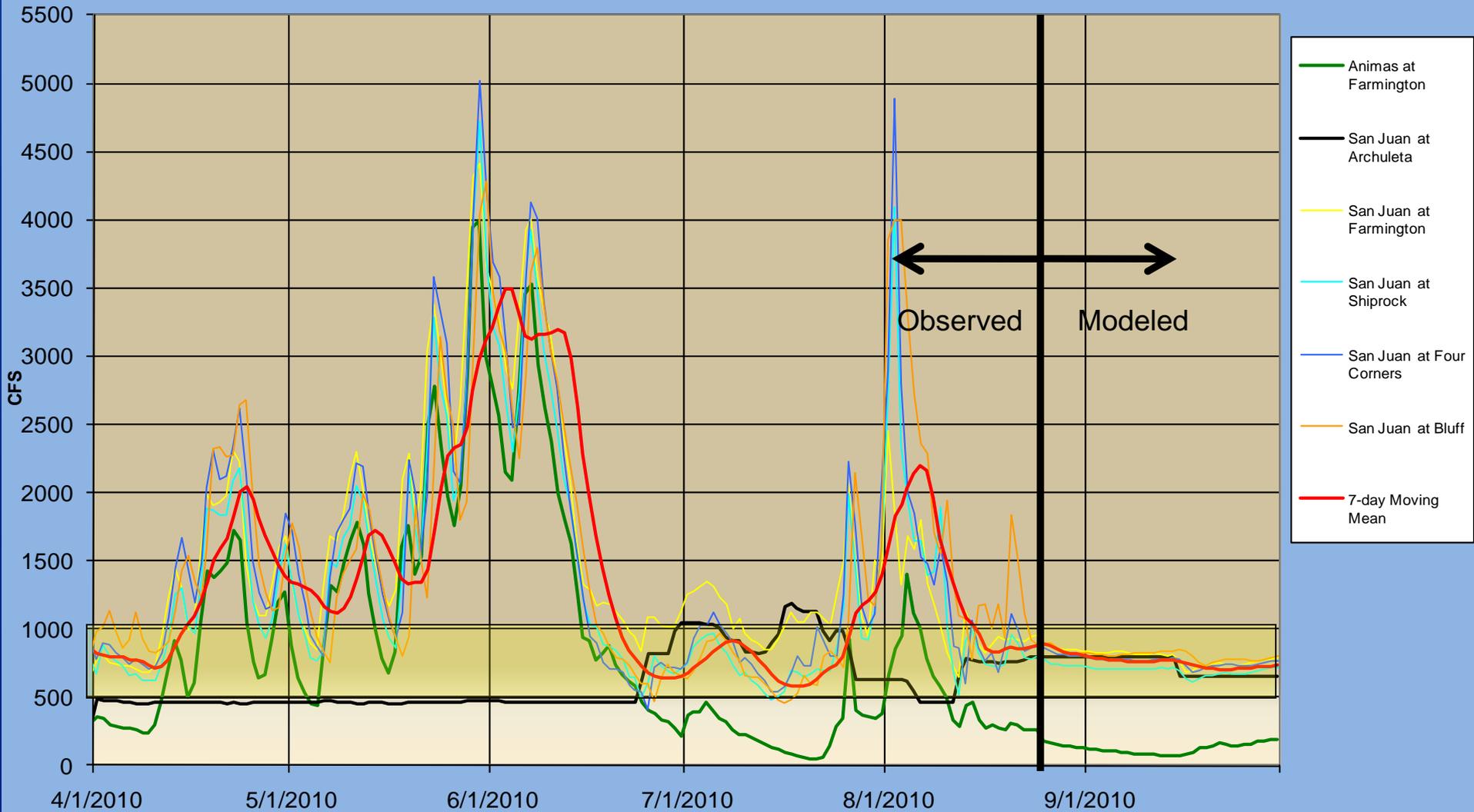


*Animas River Inflow Used



USGS Provisional Mean Daily Flows

Updated on 8/23

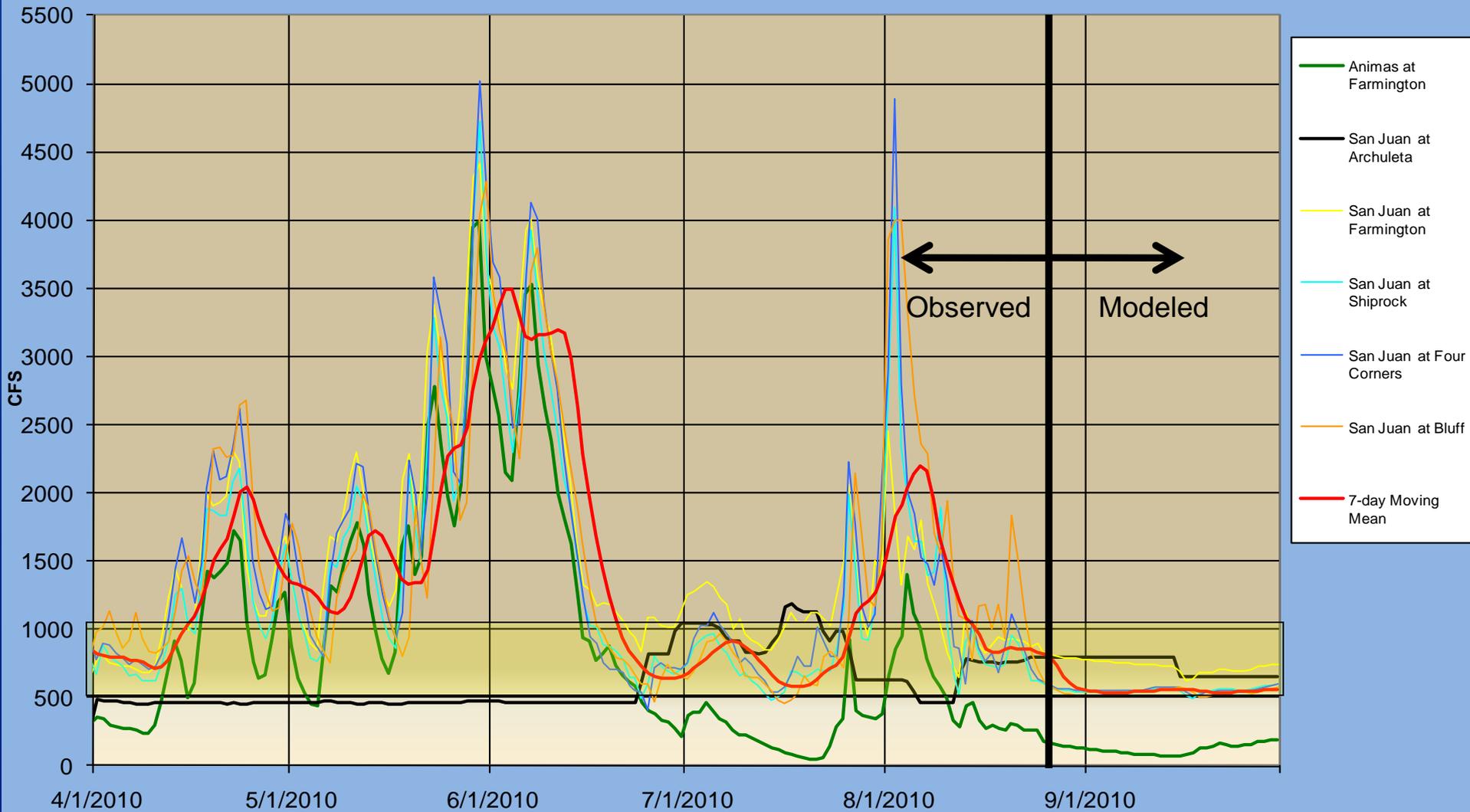


50% Exceedance Modeled Downstream Losses

RECLAMATION

USGS Provisional Mean Daily Flows

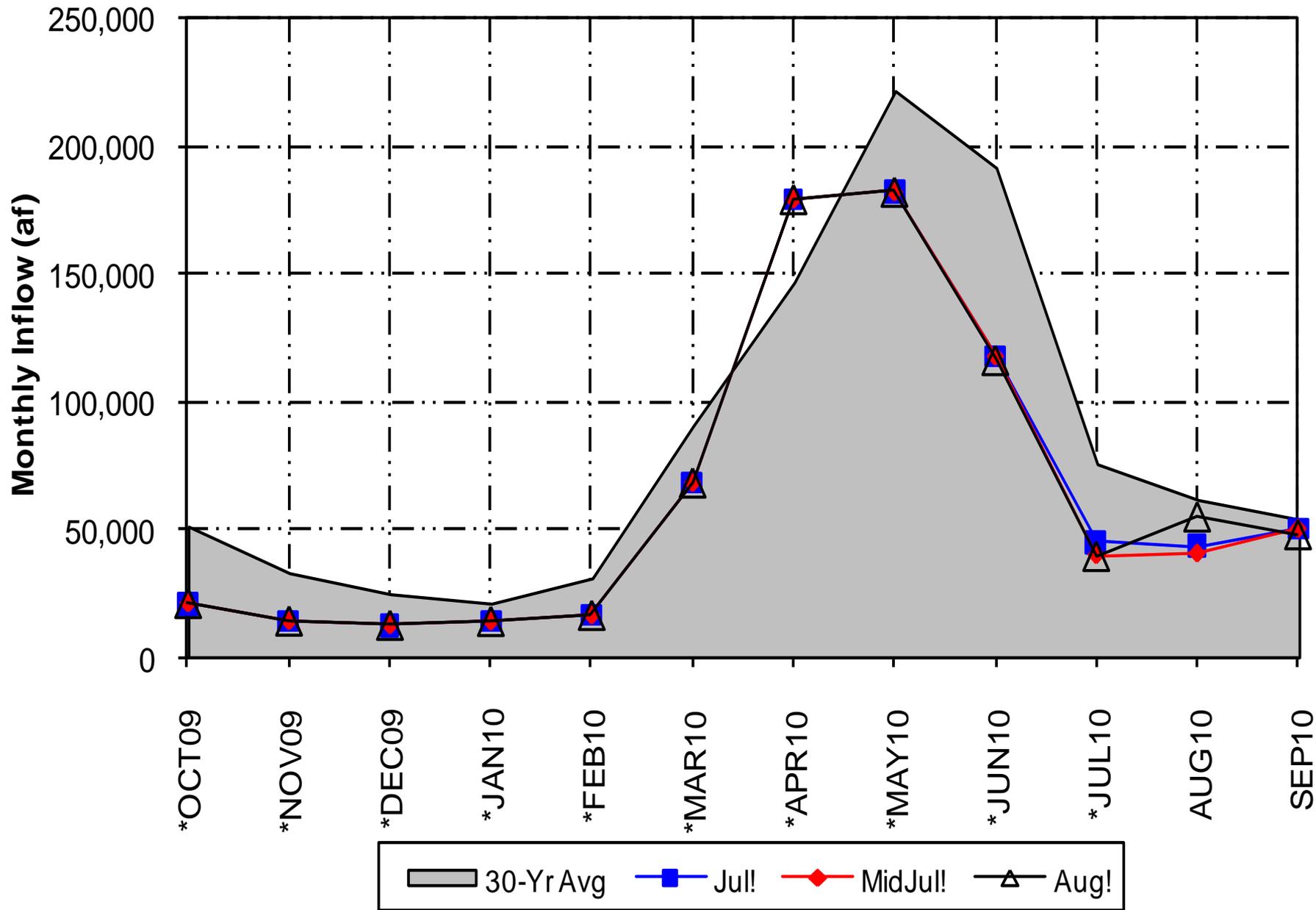
Updated on 8/23



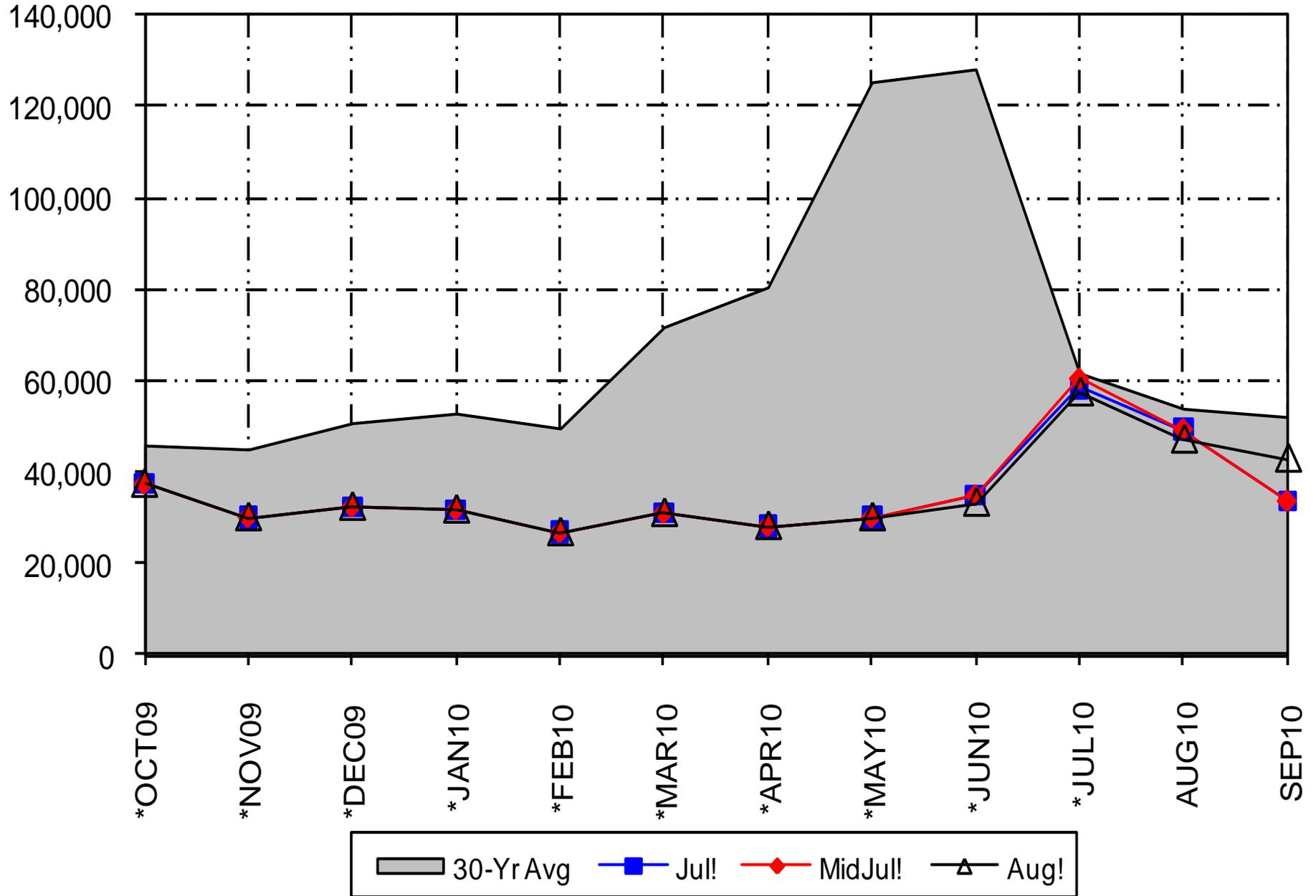
75% Exceedance Modeled Downstream Losses

RECLAMATION

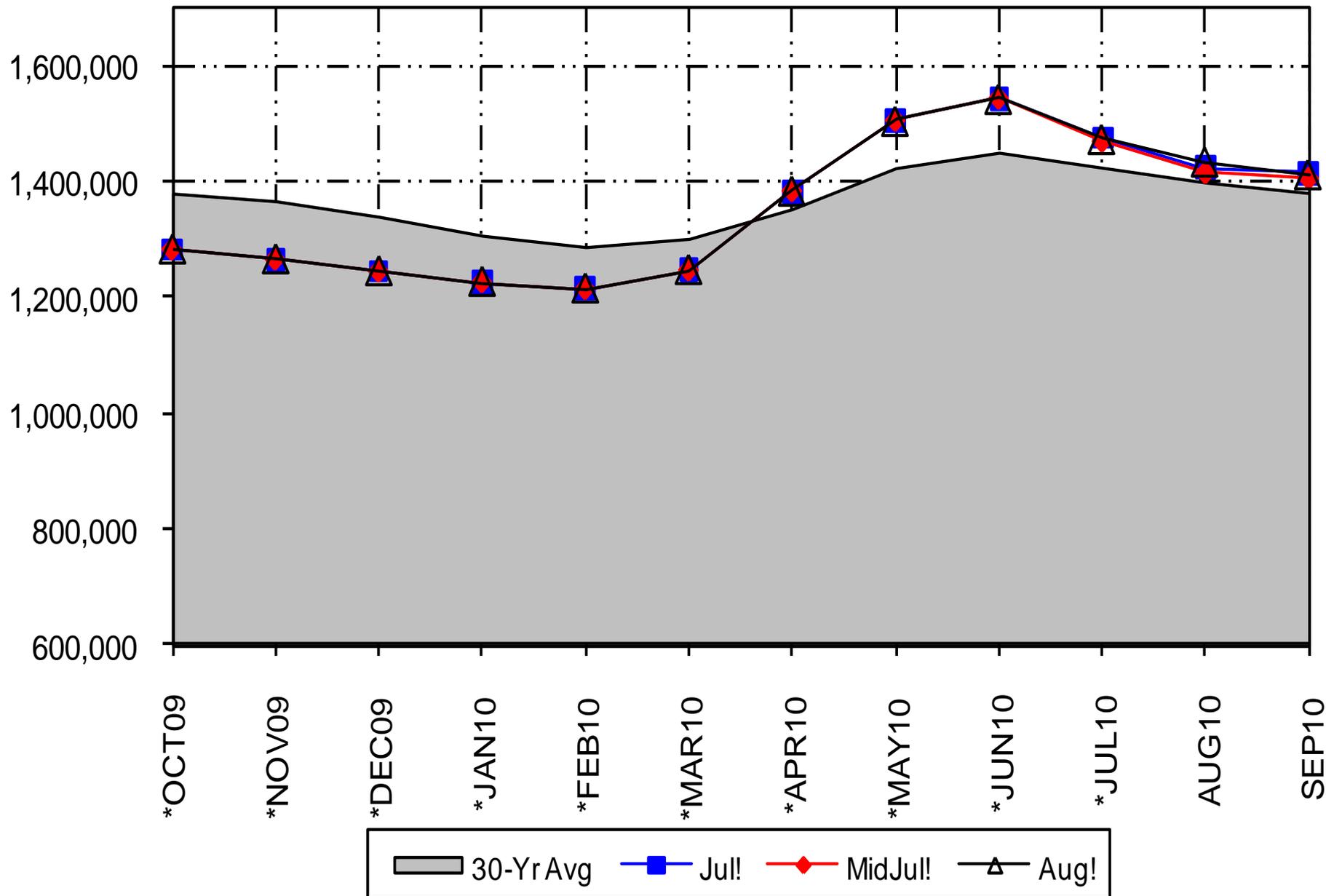
Most Prob Inflow (af)



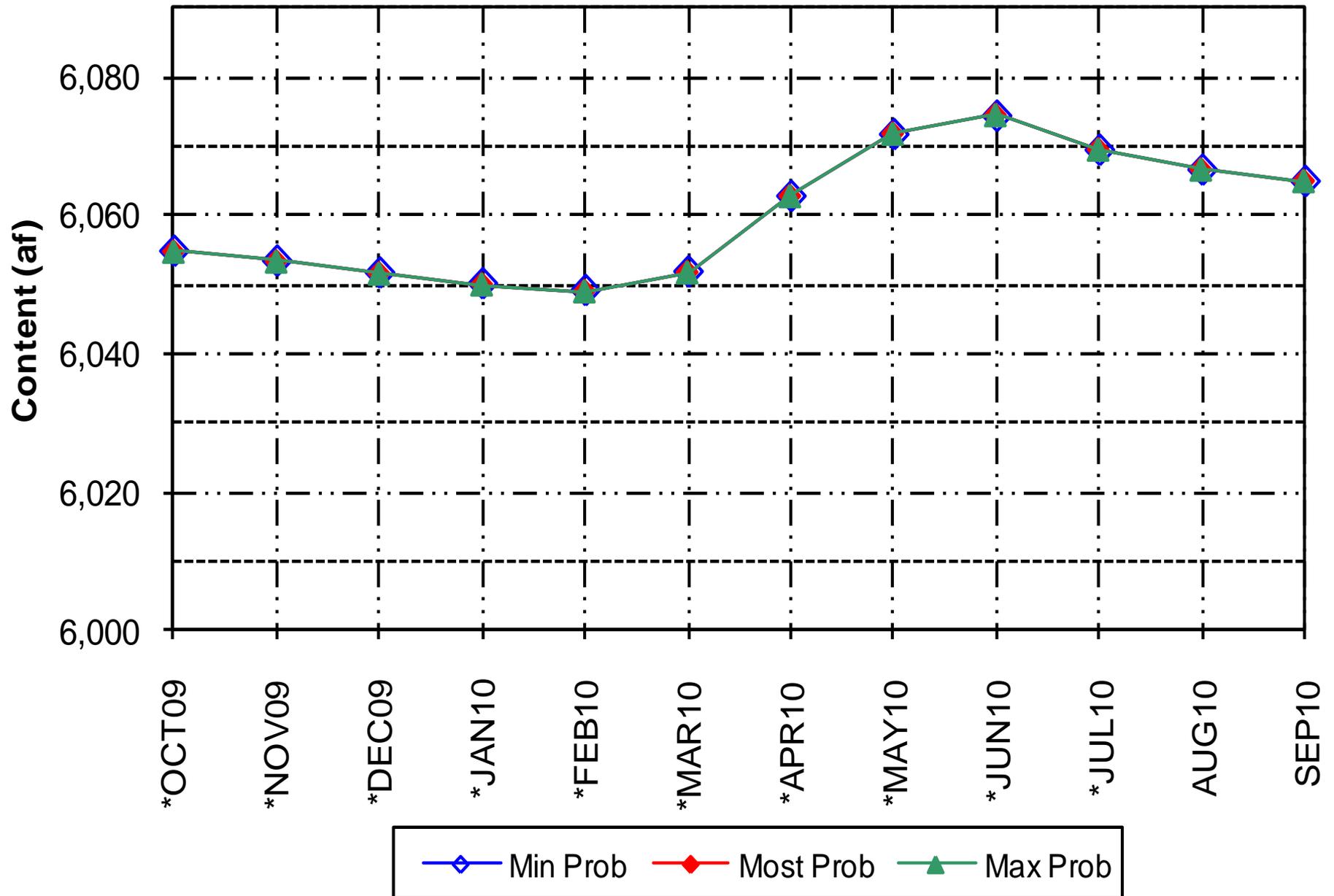
Most Prob Release (af)



Most Prob Content (af)



Elevation as of August 2010 Final Forecast



Water Year 2011 ESP Forecasts

(Note- Ensemble Streamflow Predictions (ESP) for the outlying water year are very preliminary. Actual inflows can and will likely change.)

Water Year

Most Probable – 1,030,000 af (94% average)

Minimum Probable – 491,000 af (48% average)

Maximum Probable – 1,600,000 af (146% average)

April - July

Most Probable – 737,000 af (97% average)

Minimum Probable – 295,500 af (39% average)

Maximum Probable – 1,200,000 af (159% average)

RECLAMATION

2011 Spring Peak Release

(Based on ESP Forecast)

Most Probable

Water Available = 770,000 af

Peak Release = 243,000 af (Hydrograph #3 - 3 weeks @ 5000 cfs)

Minimum Probable

Water Available = 240,000 af, No Spill

Peak Release = No Release (if no perturbation)

Maximum Probable

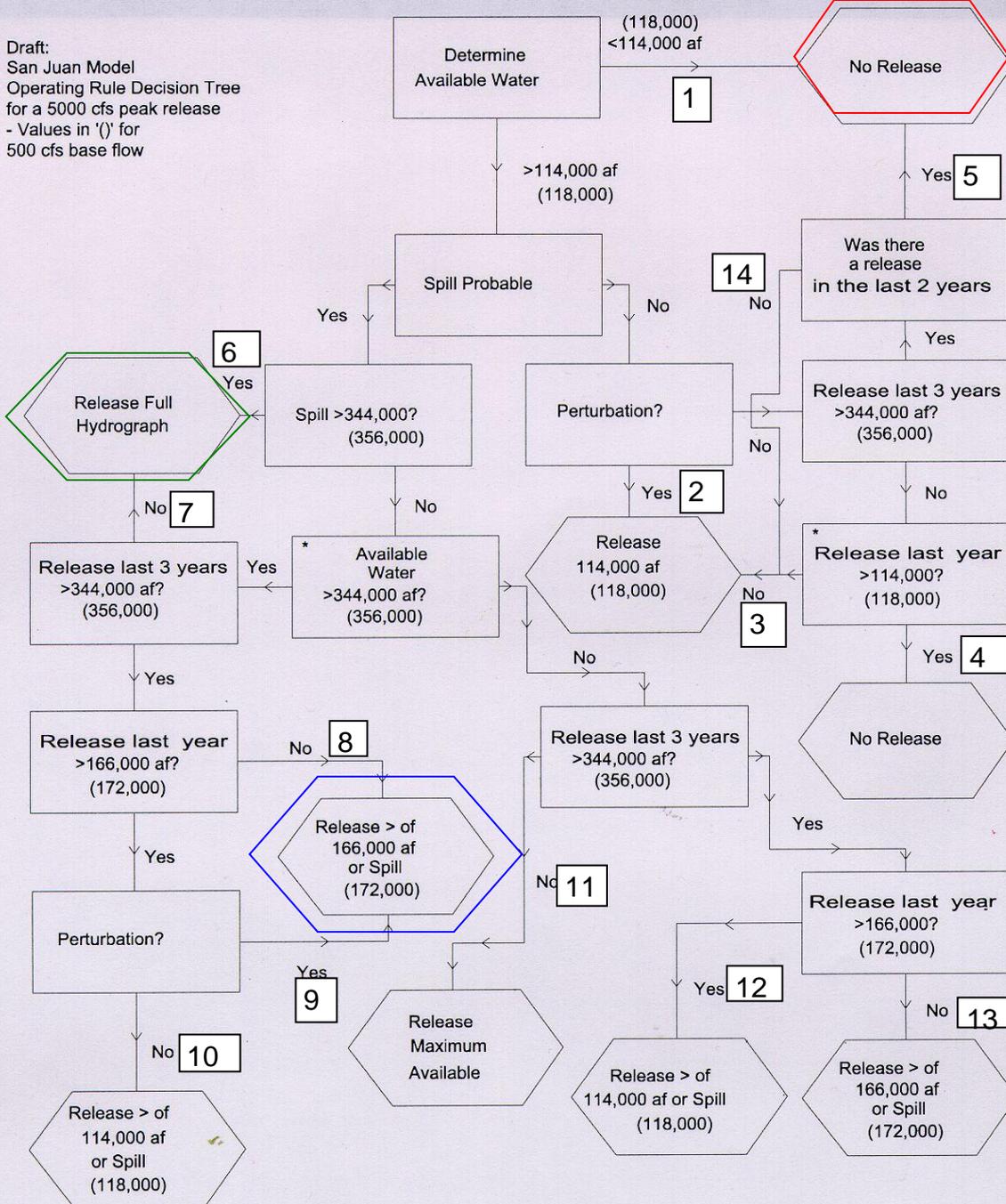
Water Available = 1,274,000 af

Peak Release = 749,000 af (Full Hydrograph – 3 weeks @ 5000 cfs)
+ bench of 3500 cfs to March 1st

Base release of 500 cfs for remainder of water year

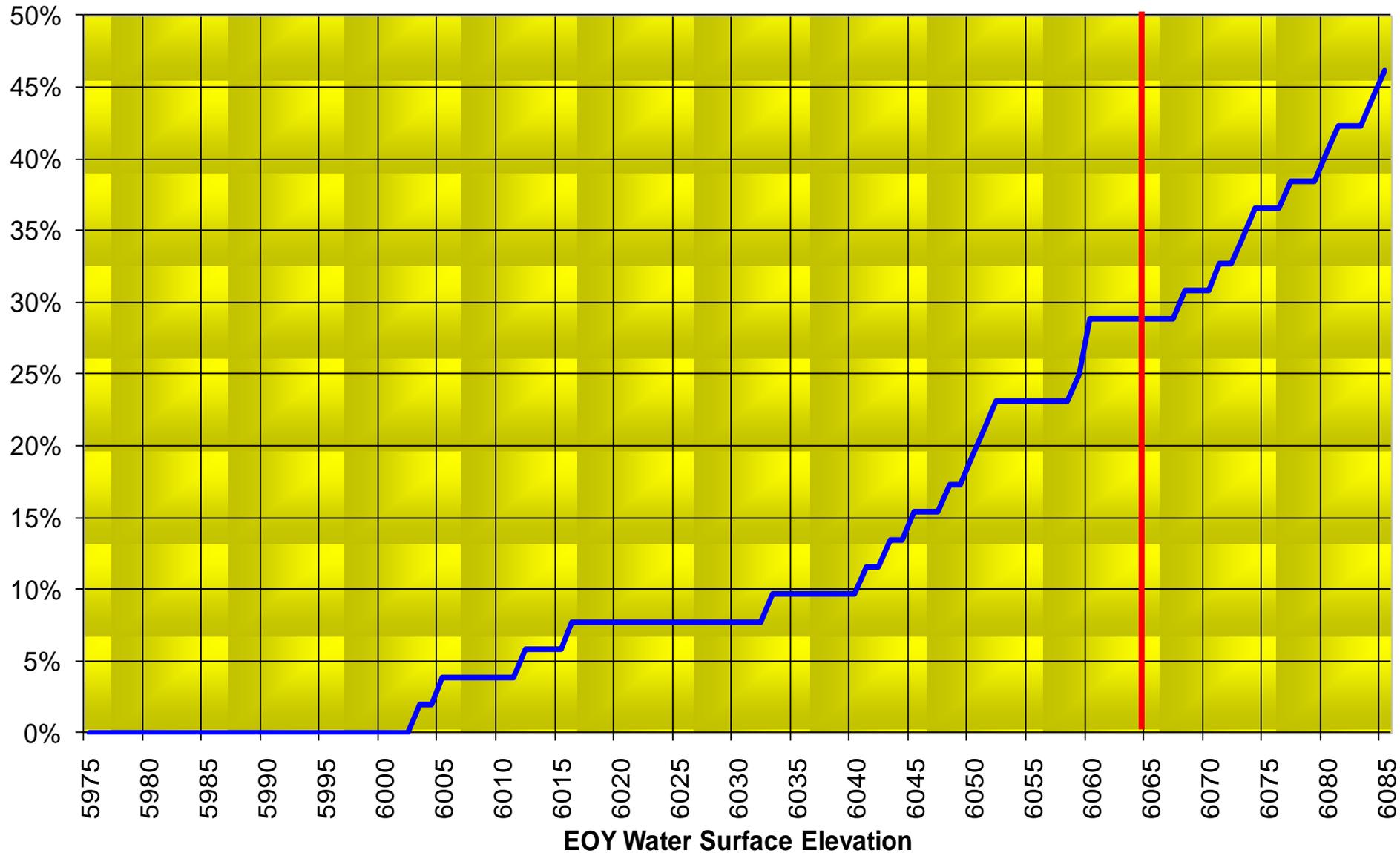
RECLAMATION

Draft:
 San Juan Model
 Operating Rule Decision Tree
 for a 5000 cfs peak release
 - Values in '()' for
 500 cfs base flow



AVAILABLE WATER	PATH
Min Prob: 240,000 af	#5
Most Prob: 770,000 af	#8
Max Prob: 1,274,000 af	#6

**Probability of Spill with Maximum Hydrograph Release
with 500 cfs Base Release (based on Water Years 1956-2009)**



— Probability of Spill



Navajo Dam Maintenance Activities

Future Navajo Dam Maintenance Activities:

- **Muck-out Stilling Basin**
 - Contract will be awarded this fall
 - Work planned for fall 2010 (duration ~6 weeks)
- **Repair 6x13 Emergency Gate Bonnet**
 - Will occur after Stilling Basin muck-out (Spring 2011)
 - Flow will be diverted through auxiliary gate for ~1 month+

Public Law 111-11

- Non-Navajo ditch improvements
 - Ten ditches expressed interest
 - Site visits occurred in May and June
 - Analyses of water efficiency improvements now underway
 - FOA to be issued in the future
 - Grants from Reclamation for funding improvements
 - Cost-share from State of New Mexico



**Fish & Wildlife Service
San Juan RIP Update**

RECLAMATION



Reports from other Agencies

RECLAMATION

Questions from the Audience

???

How You Can Access Information



Bureau of Reclamation
www.usbr.gov/uc

USGS
<http://water.usgs.gov/nwis>

Colorado Basin River Forecast Center
www.cbrfc.noaa.gov

RECLAMATION

Reclamation Contacts:

Pat Page

970-385-6560, ppage@usbr.gov

Ryan Christianson

970-385-6590, rchristianson@usbr.gov

Ruth Swickard

970-385-6523, rswickard@usbr.gov

RECLAMATION

Summary

- WY2010 had fluctuating dry and wet periods, similar to 2008 & 2009
- WY2010 April – July Inflow was 86% of average (652K af)
- There was no Spring Peak Release this year
- Minimum Release = 500 cfs
- Target Baseflow will be 500 -1000 cfs
- Release greater than 500 cfs can be expected to meet target base flows
- Expected EOWY Reservoir Elevation = 6065 ft. (102% of average)
- ESP Forecast for WY2011 shows a wide variance centered over average conditions – better idea of WY2011 conditions next meeting

- Next Operations Meeting: January ?, 2010

...and now let's talk about mussels



RECLAMATION



Thanks For Coming!

RECLAMATION